The IRON AGE

July 2, 1959 A Chilton Publication The National Metalworking Weekly

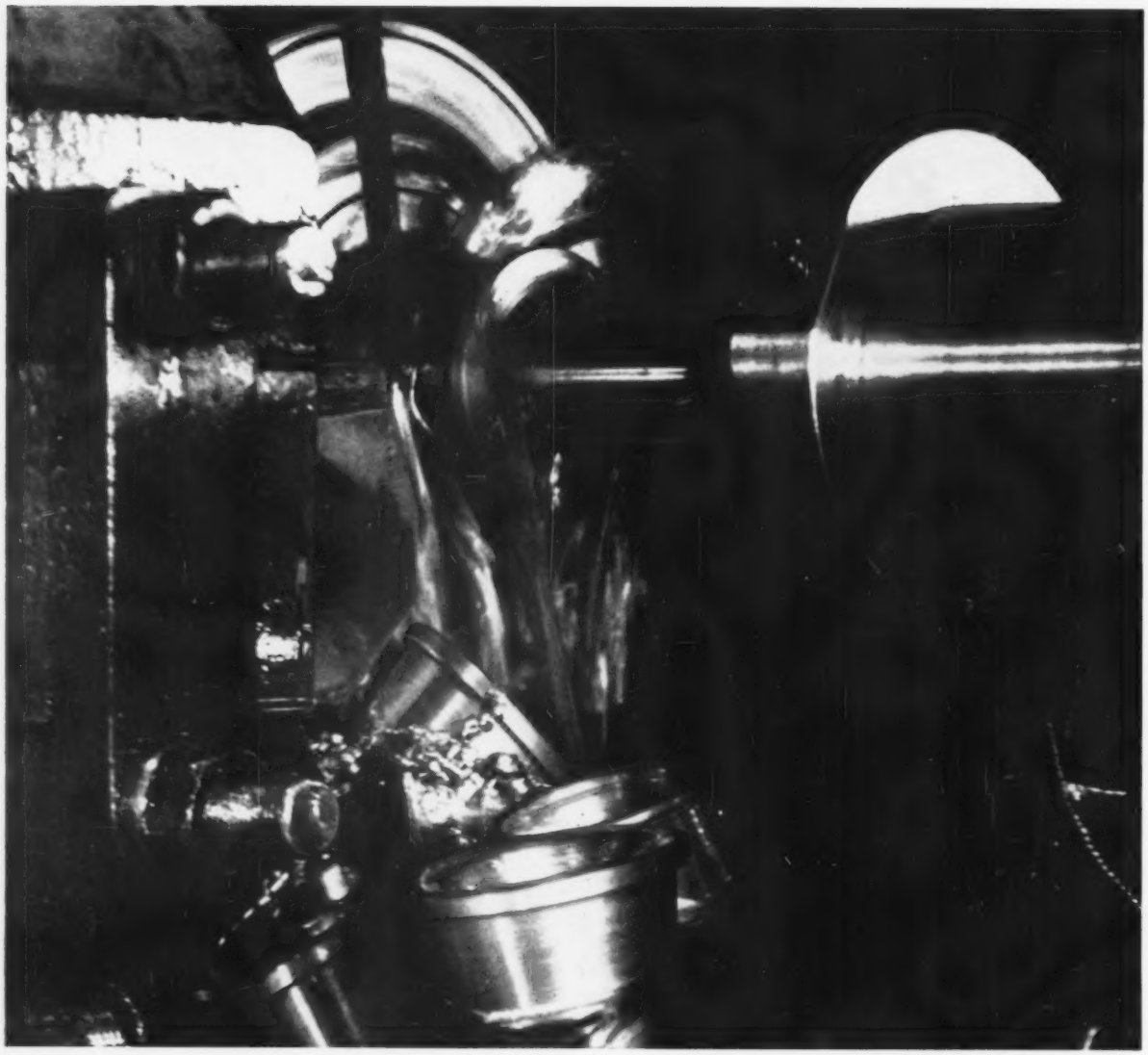
Special Report to Management—

How to Get More For Your Fastener Dollar P. 67

The Price Outlook For Second Half '59 – P. 37

Good Water Control Can Mean Big Savings – P. 42

Digest of the Week – P. 2-3



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Aristoloy uniform bearing quality steels keep green machining operations out of the red

ARISTOLOY STEELS

Physical soundness and the ability to deliver a part of uniform finish . . . these are prime requirements of a *bearing quality* steel. From the melting of carefully selected scrap in electric furnaces to final rolling and finishing, Aristoloy steels are carefully made . . . carefully controlled. The result is physical and chemical uniformity and freedom from inclusions, segregations, laps and seams that can increase rejections and make production costs soar.

For complete information about Aristoloy bearing grades 52100, 4620, 4720, 8620, and 4320, call the Copperweld representative in your nearest large city . . . or write today for NEW PRODUCTS & FACILITIES CATALOG.

COPPERWELD STEEL COMPANY

ARISTOLOY STEEL DIVISION • 4001 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

KNOW YOUR ALLOY STEELS . . .
This is the first of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

What is an Alloy Steel?

Here is an easy definition to remember: An alloy steel is a grade of steel in which one or more alloying elements have been blended to give it special properties that cannot be obtained in carbon steel.

Or, here is the metallurgical definition: An alloy steel is one in which the maximum specified content of alloying elements exceeds one or more of the following limits—

Manganese, 1.65 pct; Silicon, 0.60 pct; Copper 0.60 pct

or in which a definite range or a definite minimum quantity of any of the following elements is specified or required within the limits of the recognized commercial field of alloy steels: aluminum, boron, chromium up to 3.99 pct, cobalt, columbium, molybdenum, nickel, titanium, tungsten, vanadium, zirconium, or any other element added to obtain a desired alloying effect.

As a rule, alloy steel is more difficult to make than carbon steel. There are more elements to be kept within specified ranges and, in general, the ranges of the alloying elements are comparatively narrow; hence the mathematical chances for producing off-heats are correspondingly increased. Moreover, most alloy steels require special reheating and cooling during processing to prevent such imperfections as flaking and cracking.

Surface imperfections must be removed from the billets by scarfing, chipping, or grinding. More exacting methods of testing and inspection are necessary to insure uniformity.

Where Does It Pay To Use Alloy Steel?

Generally speaking, it is advisable to use alloy steel when more strength, ductility, and toughness are required than can be obtained in carbon steel in the section under consideration. Alloy grades should also be used where specific properties such as corrosion-resistance, heat-resistance, and special low-temperature impact values are needed.

In some cases it requires considerable study to determine when and how to use a particular alloy steel to advantage in a product. Where there is any problem or doubt concerning its use, Bethlehem metallurgists will gladly give impartial advice on analysis, heat-treatment, machinability, and expected results.

In addition to manufacturing all AISI standard alloy steels, this company produces other than standard analysis steels and the full range of carbon grades.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

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Indexed in Applied Science & Technology Index and Engineering Index.

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THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only or to people actively engaged therein, $5 for 1 year, $8 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single Copies 50¢. Annual Review Issue $2.00. Cable: "Ironage," Philadelphia.

The IRON AGE

July 2, 1959—Vol. 184, No. 1

Digest of the Week in

★Starred items are digested at right.

EDITORIAL

The Berlin Crisis: The People Are Out in Front 7

NEWS OF INDUSTRY

★**Special Report:** Price Boosts Loom as Cost Pressures Mount 37
★Alcoa in Britain 39
★New Look in Steel Bargaining 40
★Contract Extension: What It Means 41
★Water Conservation Can Pay Off 42
Integrated Mill for Missouri? 43
★Mobile Homes Use More Metal 44
★Why Workers Are "Eating In" 45
The IRON AGE Salutes 49
Men in Metalworking 65

FEATURE ARTICLE

★How to Get More for Your Fastener Dollar 67

NEWS ANALYSIS

Newsfront 9
Report to Management 51
Automotive 53
★Washington 57
West Coast 59
Machine Tools 61

MARKETS & PRICES

Market Planning Digest 35
★**The IRON AGE Summary** 105
★Purchasing 106
Steel Product Markets 108
Index to Prices 109
Iron and Steel Scrap Markets 110
Nonferrous Markets 112
Clearing House 122

REGULAR DEPARTMENTS

Letters From Readers 11
Fatigue Cracks 13
Coming Exhibits, Meetings 15
Industrial Briefs 62
Free Literature 84
New Materials, Components 97
New Equipment 100

INDEX TO ADVERTISERS 128

NEWS ARTICLES

STEEL LABOR TALKS

A New Technique Unfolds—The steel labor talks have brought to light a new approach by steel management. This behind-the-scenes story tells what it is and why it was adopted. P. 40

CONTRACT EXTENSION

What It Means to Steel Users—The steel labor contract extension to July 14 means that steel mills will have a good chance to clean up order carryovers. P. 41

WATER CONTROL

Savings for Industry—Big water users are finding it profitable to

study their water costs. Substantial savings are often possible in process design, pumping, and water treatment. P. 42

IN-PLANT FOOD

Popular Trend — An extensive survey by the Agriculture Dept. uncovers industry's eating habits.

Metalworking

SELECT FASTENERS: The way you buy and use mechanical fasteners may represent one of your biggest cost-cutting areas. This week's special report points out how management can set up a workable system. Russell, Burdsall & Ward Bolt and Nut Co. photo. P. 67

Many executives feel in-plant food services contribute to employee morale and productivity. P. 45

LABOR REFORM

AFL-CIO For It—Union leaders say it would be better to take a slap on the wrist now than get slugged in '60, an election year. A mild law would close the issue, they think. P. 57

FEATURE ARTICLE

HOW TO GET MORE FOR YOUR FASTENER DOLLAR

Check Types and Sizes — The management of one company was amazed to find that it carried 23,000 types and sizes of mechanical fasteners in stock. By cutting down on the number, it's possible to realize savings in buying, stock handling, and assembly costs. P. 68

Screw Threads—Many controversies exist about various screw-thread factors. They needn't affect you if you understand the basic concepts. P. 71

For Strong Joints—The clamping force in a threaded fastener is a latent property until you tighten it. The more you tighten these items, the more you get for your fastener dollar. P. 72

Use Standard Nuts—A nut needs certain properties to apply and hold sufficient pre-load tension on a bolt. Standard nuts are well designed to do just that, and at the lowest overall cost. P. 77

Tapping Screws—Basically there are two types of tapping screws: Thread forming and thread cutting. Again there's a tendency to use too many of the available types and head styles. Also to be considered is whether fastener is to be permanent or conveniently reusable. P. 78

Special Types — If a standard fastener just won't do the job, the versatile heading process—hot or cold—can probably produce what you need at a surprisingly low cost. High-speed heading machines are well suited to the rapid production of special designs. P. 80

MARKETS & PRICES

PRESSURE ON PRICES

Industrial Price Outlook—Industry experts look for prices to rise during the next six months. Their forecast is based on long-term trends. Labor contract talks will have a bearing. P. 37

ALUMINUM

Alcoa in Britain—Alcoa finally gets a foot in the British market as it forms a fabricating subsidiary, Imperial Aluminium Co., Ltd., with Imperial Chemical Industries, Ltd. P. 39

MOBILE HOMES

Big Metals Market — The old house trailer has become bigger and swankier. "Mobile homes" they're called now. Sale of metals to this market is growing by leaps and bounds. P. 44

THIRD QUARTER BOOKINGS

How Solid?—For both July and August, steel mills have capacity bookings for many items. But there's a question whether August backlogs will stand up. P. 105

SELECTING SUPPLIERS

Consider More Than Price—Suppliers should not be judged on price alone, says Westinghouse's president Mark W. Cresap. Aid firms that develop the art of their field, he urges. P. 106

NEXT WEEK

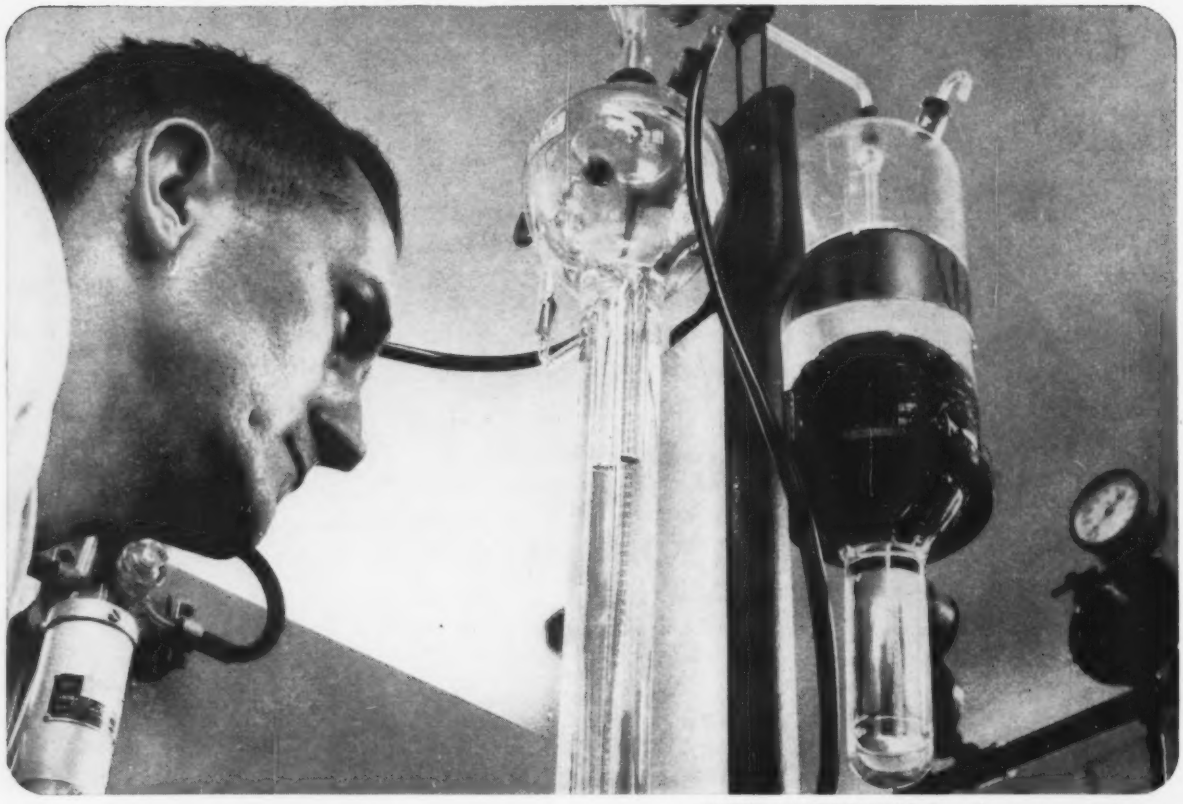
USSR EXPOSITION

A Look at Soviet Industry—Next week's special report is an analysis of what Soviet industry is showing at its industrial exposition in New York. The study covers machine tools, power equipment, and other machinery.

TUBE INSPECTION

One Hundred Pct.—The long search for a foolproof method to check high pressure tubing may have reached the end of the road. Next week's technical feature describes a new eddy-current test that reveals location and size of all flaws.

***Experience**—the added alloy in **Allegheny Ludlum** tool steels*



QUICK, FAST TESTING for carbon content is done not once or twice but 8 times per melt in A-L's Chem Lab with this direct reading Leco carbon determinator.

Carbon content checked 8 times during melt to guarantee A-L tool steel hardenability

Lab tests for carbon eliminate your guesswork; provide high hardness, uniform hardenability, reproducible tool performance.

Because carbon has the greatest influence on hardenability, Allegheny Ludlum watches it carefully during the melt. Testing a specimen for carbon takes only a few minutes. Therefore, A-L checks for carbon content 8 times during the melt, and makes the necessary adjustments to insure accurate control of carbon. This control means Allegheny Ludlum can hold carbon content to a closer range than most customers specify.

Carbon control at Allegheny Ludlum assures you of precise response to heat treating. This control in the melt brings you predictable, *high hardness, uniform hardenability* and *reproducible tool performance.*

This is just one of the many things A-L does to insure high quality. Here are some others: close control over forging techniques, rigid temperature-time programming, careful testing of billets prior to processing to insure good surface and sound interior, control over annealing to give you the right hardness for your exact machining operation, thorough metallurgical testing to insure top tool steel quality and meeting of your specifications.

Allegheny Ludlum stocks a complete line of tool steel sizes and grades. Call your nearest A-L representative; you'll get quick service and counsel on such problems as heat treating, machining, grade selection, etc. Or write for A-L's publication list which gives full data on the more than 125 technical publications offered. They'll make your job easier.

ALLEGHENY LUDLUM STEEL CORPORATION, Oliver Bldg., Pittsburgh 22, Pa. Address Dept. A-19.

WSW-7261

ALLEGHENY LUDLUM

Tool Steel warehouse stocks throughout the country... Check the yellow pages

every grade of tool steel... every help in using it

CARL S. HARVEY, *Technical Director, Lamson & Sessions, tells why...*

You overspend when you overspecify... on fasteners

Overspecifying can be costly in ordering fasteners . . . especially in view of the trend toward higher "physicals" and correspondingly higher component costs.

Here's a typical example: A customer specified AISI 1137 steel (a screw machine grade) for a nut. After a look at the "physicals" we recommended a cold forged nut of AISI 1030 steel (a straight carbon steel) and met all requirements at considerably lower cost to the customer.

In many instances we're recommending ordinary grades of carbon steel over the customer's specs of low alloy content material. Our improved heat treatment practices make the savings possible. Elementary cases, perhaps, but they happen every day!

Take Advantage of the specialized experience and facilities available to you through L&S. Leave reference to "chemistry" open. Tell us what you want in end results. Give us the "physicals" and tolerances—then stop! This helps us save *you* money, in both purchasing costs and assembly costs.

L & S Fastener Engineering helps you "tighten up" on...

- **PURCHASING COSTS**
- **INSPECTION AND HANDLING COSTS**
- **ASSEMBLY COSTS**

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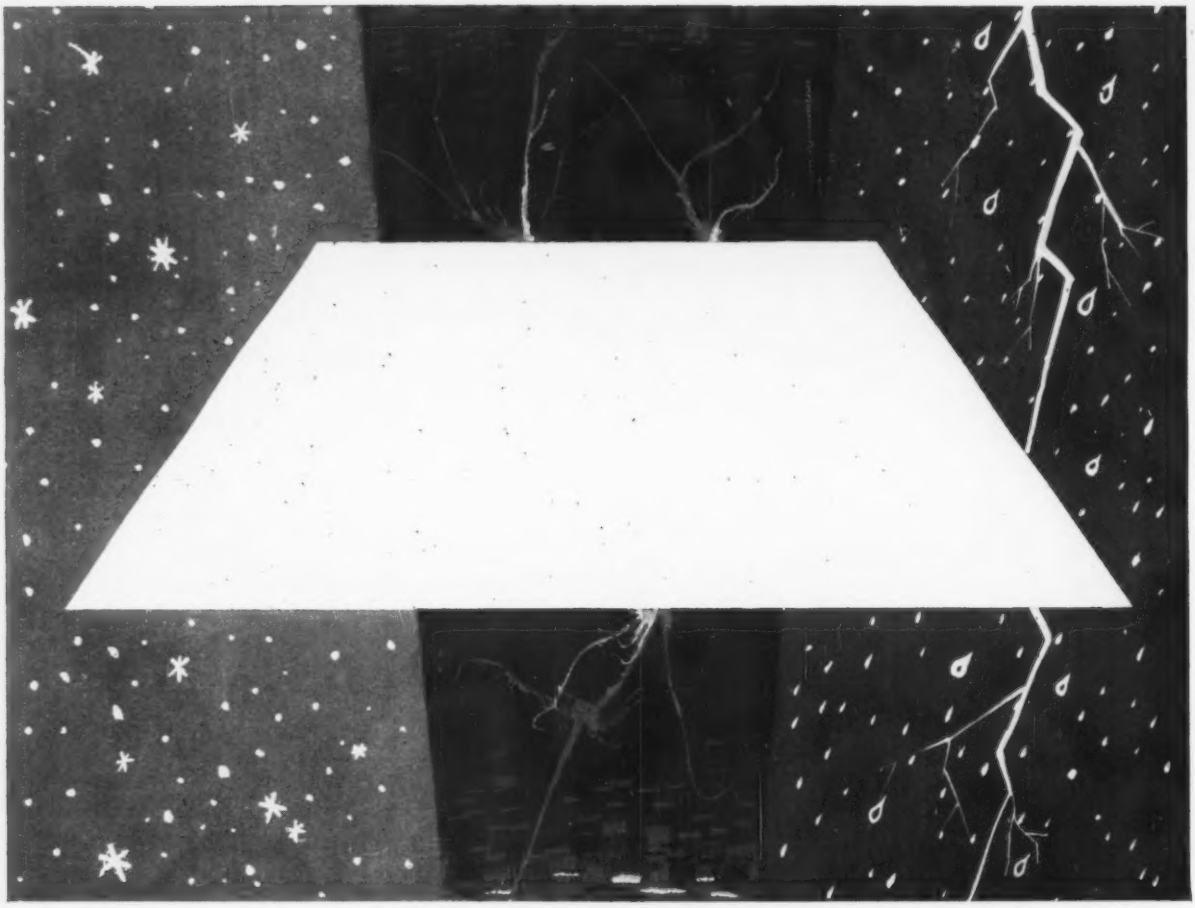


Armco ALUMINIZED STEEL Type 2 beats back corrosion outdoors

Armco ALUMINIZED STEEL Type 2 was created to resist outdoor corrosion. 20-year tests in a mild industrial atmosphere show that the aluminum coating on this special sheet steel averages three times the life of a standard zinc coating on unpainted galvanized sheets.

At the same time, strength, attractiveness, low cost, workability, and radiant heat-reflecting efficiency are combined in ALUMINIZED STEEL to make it ideal for a growing range of outdoor applications.

Here's the secret of its unique advantages: Armco ALUMINIZED STEEL Type 2 is sheet steel coated on both sides with aluminum by an Armco-developed patented hot-dip process. It's a 2-in-1 metal—with the surface advantages of aluminum and the strength of steel.

For more information, write Armco Steel Corporation, 2749 Curtis Street, Middletown, Ohio.

New steels are born at Armco

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

The Berlin Crisis
The People Are Out in Front

We often hear that the man on the street is not hep on world conditions. That isn't so when it comes to standing up to the Communists.

Efforts to get the Allies out of Berlin is an old Communist chestnut. It has been tried before. It will be tried time and again. This time it is creating a crisis.

The Foreign Ministers will be back in Geneva in a week or so. Between now and then it will be wise for all of us to give our complete support to our nation, to President Eisenhower and to those who are facing Gromyko (and thus his boss, Mr. Khrushchev.)

The Reds never intended to "give" at any point in the meetings. They did all the demanding. We went so far that for a while it looked as though the Russian dictator had us buffaloed.

If the time comes when we are going to "give" just for the sake of being loved throughout the world, then we will have lost. There is no way to deal with the Reds except to show that we mean what we say; that we will call bluffs; and that we are not afraid to take the risks.

So far it appears as though some of our allies are at odds with us or with each other. That isn't too much to worry about. At the proper time all of us will be properly lined up.

That is exactly what will happen to the American people. Not one person who has his wits about him is ready to allow the Reds to win by bluff, default, or threat. That is what Mr. Khrushchev is trying to do. The record shows that he hasn't given one inch. He wants us to give a foot and then another foot. Finally he wants it clear that we think he is great and is the proper medicine for his satellites.

The American people do not want war. They do not and cannot condone rash talk or military jingoism. But at the same time there isn't one person who calls himself a real American who will back down on threat and attempted intimidation.

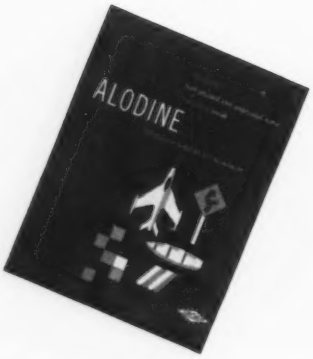
To support this stand we must be strong enough to meet anything that comes up. That's why we should write to our President and to our representatives in government to see that everything is being done that can be done to back our feelings with strength.

Now is the time to do it!

Tom Campbell

Editor-in-Chief

6 of the best in finishing chemicals for the metalworking industry!



Amchem Alodine — for improved corrosion resistance and paint bonding of aluminum. Write for Bulletin 1424B.

Amchem Granodine—protects iron and steel from corrosion, firmly bonds paint finishes. Write for Bulletin 1380A.

Amchem Granodraw—improves drawing and cold forming of steel and stainless steel. Write for Bulletin 1437.

Amchem Rodine—pickling acid inhibitors reduce acid consumption, save steel. Write for Bulletin 1381A.

Amchem Cuprodine—produces bright, adherent copper coatings on carbon and stainless. Write for Bulletin 1448.

Amchem Lithoform—promotes excellent paint bonding of galvanized iron, zinc and cadmium. Bulletin 1447.

Amchem produces a complete line of finishing chemicals to prepare, protect and beautify your products. Write for complete guide contained in Bulletin 1413B. Address Ambler 26, Pa.

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Incentives Get Results

An incentive plan at a fabricating plant for yard crews has had surprising results. One crew has handled most of the work done by about 2½ crews before. A second crew is added only during peak production periods. Workers get about a 20-pct bonus and labor costs have dropped from 12 pct to 7 pct of plant payroll. A 12-week time study period in winter and summer was averaged out for various materials to set up the system.

Test Modulus of Elasticity

Soon to be announced is an ultrasonic method for measurement of modulus of elasticity in metals and ceramics. The non-destructive test setup can be used in programming temperature changes with modulus of elasticity as the dependent variable.

Spark Plug Wire Takes Heat

A new spark plug wire has been developed for use where high engine compartment temperatures crack or damage conventional wire. It has a special silicone insulation with glass braid. The wire is made of seven strands of low capacitance stainless steel wire which are covered with a high dielectric silicone compound. The inner core has glass over braid for heat protection and strength.

Beam Welding for Tube

With increased use of stainless tubing for such applications as condenser tubing, ways are being sought to boost tube production. One promising setup uses an electron-beam welding unit that turns out quality stainless tubing in gage thicknesses at about 300 fpm.

Forecast on Labor Force

America's labor force will be about one-third larger 15 years from now. It'll be due in part to a sharp jump in the number of women and children who will be working part-time. Labor experts say today's 70 million workers will jump to 80 million in 1965 and 95 million a decade later. Young inexperienced workers will increase sharply, toughening competition for starting jobs.

Method Takes More Scrap

A new operating technique reportedly permits the use of up to 50-pct scrap in LD oxygen steelmaking vessels. The scrap limit for LD vessels has been about 35 pct. No details are available on the new practice, but it's said to involve the use of coke particles and a slight increase in oxygen.

High-Strength Sealer

Just announced is a new synthetic plastic adhesive and sealer. It's activated by mixing hardener with base, then can be applied with trowel or putty knife. Result is high-tensile bond from either heat or atmosphere curing. Expected industrial uses include filling sand holes in castings, valve repair and toolmaking.

Legal Questions in Strike

If a strike of a key department or plant forces a shutdown of whole company, legal men doubt that many states will follow Michigan's lead in paying unemployment compensation to non-striking but idled workers. According to one expert in labor law, the shutdown may be labelled a general strike, even if two different unions are involved, provided both are affiliated with AFL-CIO.

Inside Choice for Commerce

Ike's new Secretary of Commerce probably will be recuited from government, not from industry. Reason: In just 18 months, the Eisenhower Administration will be out of business. Few businessmen can make the personal sacrifices required for joining a President's cabinet for a short term. Likely candidate: Frederick Mueller, now Under Secretary of Commerce and former Grand Rapids furniture executive.

LIGHT GAUGES

at High Speeds

Need Rugged

Equipment

Each step toward paper-thin tin plate accentuates the operating problem. Tracking becomes more acute as speeds increase. Coils increase in diameter and weight. Tension becomes more critical.

Only rugged machinery, for which Aetna-Standard is noted, can stand up to 21-turn operation at high speeds with a minimum of strip breakage, down time and maintenance.

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AETNA-STANDARD DIVISION
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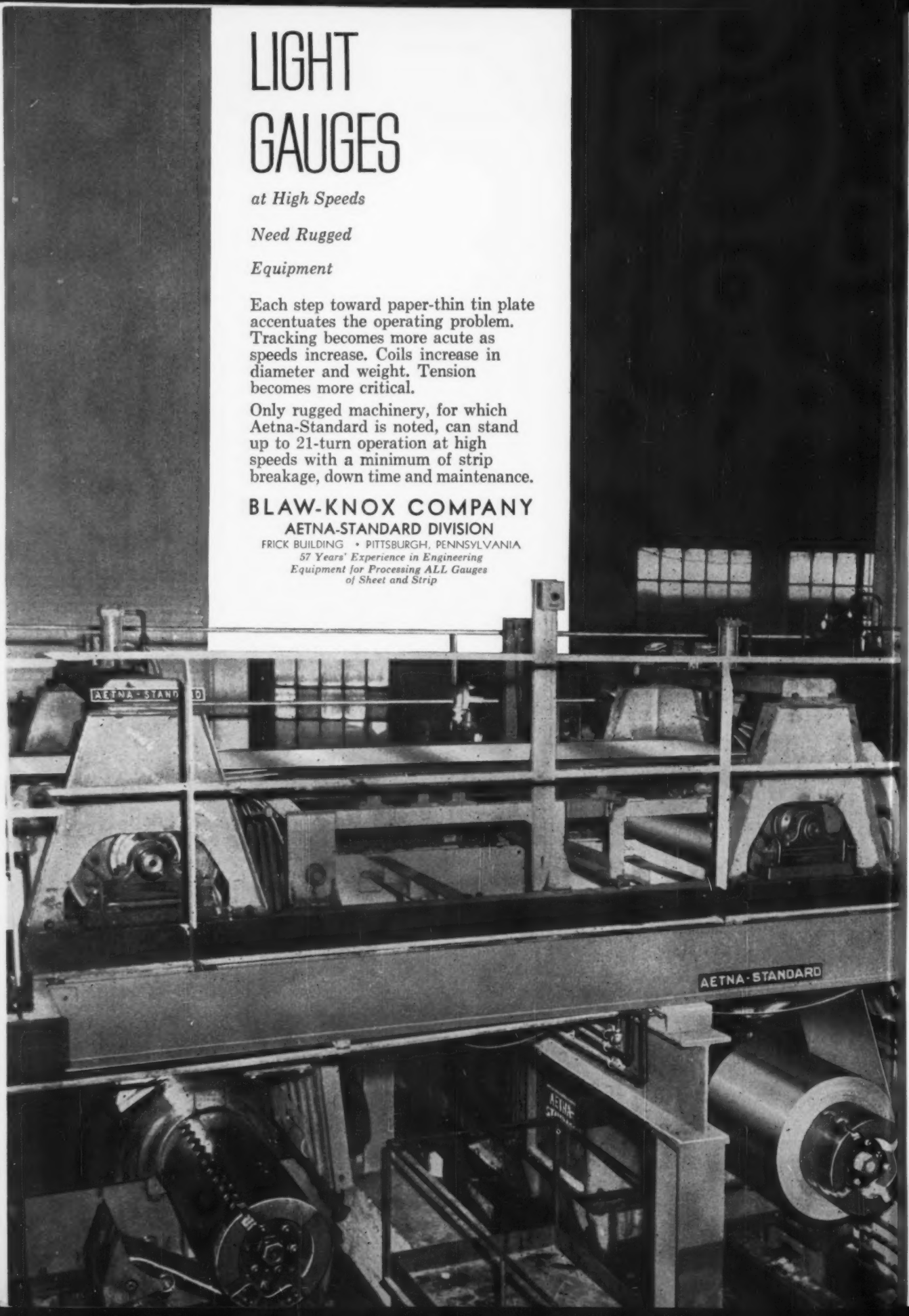
57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip



Leadership

Sir—Your June 4 issue carried an article by S. M. Boyden on "How to Prepare for Greater Business Responsibility."

We feel this is a very good contribution, and would like to distribute copies to key people in several plants of our company.—L. Erwin, Director, Industrial Relations, The LFM Mfg. Co., Atchison, Kan.

Sir—This is an excellent article and I want to be sure it gets good circulation among the members of my staff.—J. M. Rathbun, Chief, Branch of Supply, U. S. Dept. of the Interior, Bonneville Power Adm., Portland, Ore.

Sir—At the end of "How to Prepare for Greater Business Responsibility" you offered reprints.

Would you please send me a couple of copies of this most worthy article.—L. Allen, Mgr. of Works, Fabricated Steel Construction, Bethlehem Steel Co., Pittsburgh.

Sir—Please send me a copy.—R. N. Mitchell, Plant Superintendent, Reynolds Metals Co., Richmond, Va.

▪ **In all cases reprints are on the way. Since publication this article has brought in over 200 letters asking for 800 reprints.—Ed.**

Wage Talks

Sir—Let's start with the premise that at this eleventh hour there is only one possible solution to the steel wage problem and that is a moderate cut in steel prices and a continuation of present wage rates.

Now let's take a positive and objective view of this solution and ask what are the major objections and how can they be overcome.

The fact that a price reduction was tried about ten years ago and didn't work because of increased costs would not seem to be a valid reason for not trying it again in 1959.

Break-Even Points—This is true because in the decade since, technological advances have tended to reduce unit costs. This is evidenced by the lowest break-even point in the history of the industry. Only by encouraging demand (which would be stimulated by a price reduction) can this equipment be utilized to reduce unit costs. It is also a fact that many things that would be seriously affected by wage or price increases are present today that were not present ten years ago.

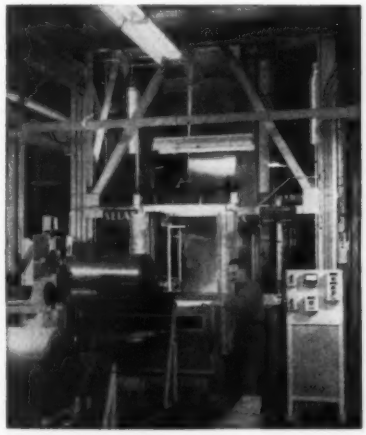
Unfair to Whom?—Would it be unfair to customers who have built up large inventories during this period? (Incidentally, since when are the steel companies so concerned in this regard?)

Or let us ask, would it be more unfair to customers to have them face up to a long and bitter strike, during which time a great many of them will run out of steel and have to shut down, probably at considerably greater loss? Is it unfair to the customer to add to inflation (prices and wages)?

In other words, from the customer's view, what is the fairest solution?

Two Roads—Is it a slight reduction in steel costs, which probably 100 pct can handle without too much difficulty, and a guarantee that his steel supply will continue without interruption? Or is it maintenance of his present steel price to protect his inventory at the cost of a prolonged strike, with the possibility of a steel shortage that will eventually curtail or shut down his operations (to say nothing of the highly important inflationary angle) —R. S. Smith, President, Rigidized Metals Corp., Buffalo, N. Y.

To meet demands for perfect finish on stainless and nickel Thinstrip®, Somers installs unique new annealing furnace.



This new Selas vertical continuous annealing furnace assures uncontaminated, commercially unmarred surfaces as well as uniform temper and faster delivery on stainless, nickel and nickel alloy Thinstrip up to 25" wide. But this is only part of the story of Somers' quality. Sendzimir rolling mills, Accu-Ray gauging plus 50 years leadership in thin gauge metals (from .010 down to .000125") are a few of the features Somers offers to assist you with your Thinstrip® problems.

Write for Confidential Data blank — no cost or obligation.

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Somers

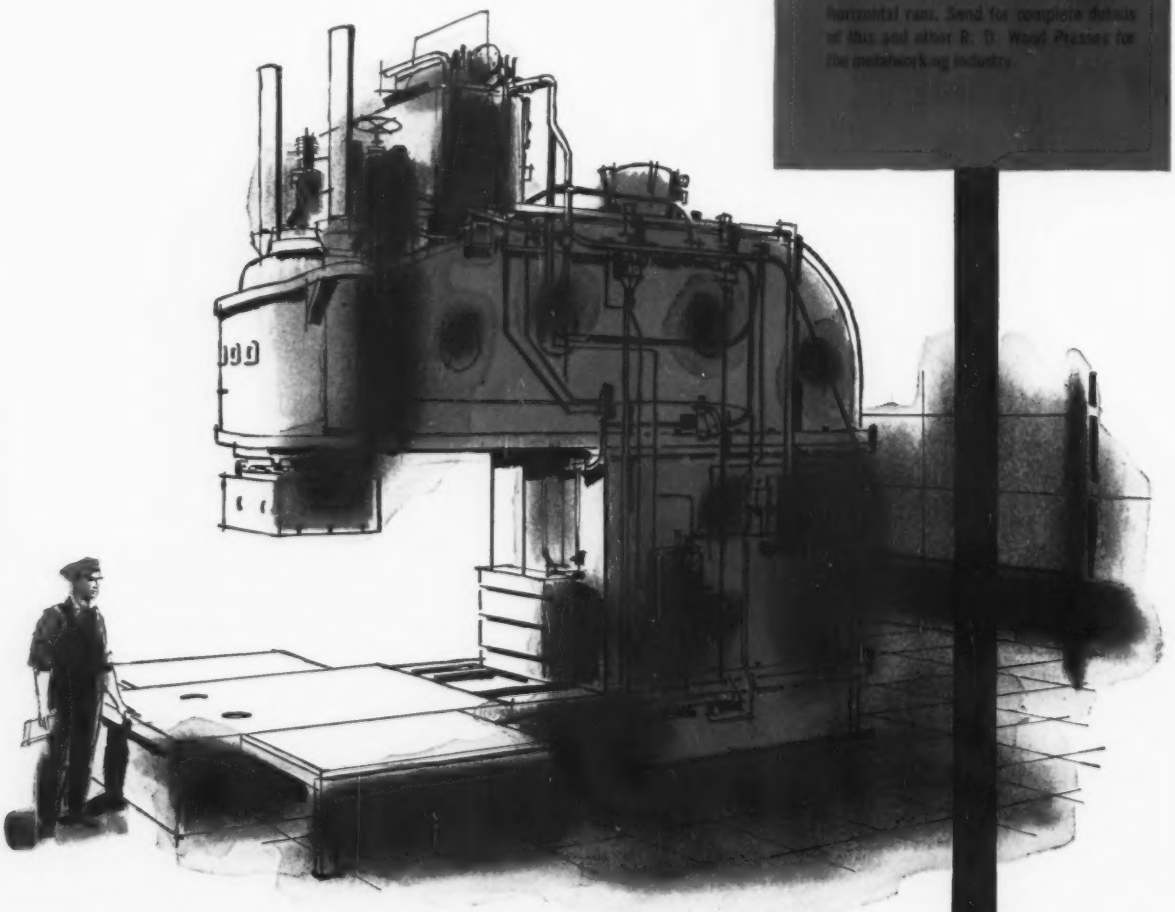
Somers Brass Company, Inc.

102 BALDWIN AVE. WATERBURY, CONN.

There's always a job for a Wood Press . . . and a Wood Press to do the job

When you want a production shortcut—when downtime and costs need shrinking—there's a job for a Wood Press. And in almost every type of metalworking operation—there's a Wood Press to do the job. R. D. Wood makes standard presses for an amazing range of uses, besides designing others for special work. All have three things in common: sound design, carefully chosen materials, conscientious workmanship. *Result:* R. D. Wood Presses consistently deliver the utmost in smooth, dependable performance; fast, economical production; trouble-free operation. Write for catalog and engineering information—without obligation.

250 ton, Hairstactic core pin, self-contained press for straightening, flanging, forming, forcing and bending operations. Handles all metals. Valve system contains centralized controls for both main ram and horizontal ram. Send for complete details of this and other R. D. Wood Presses for the metalworking industry.



R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

Lively Subject

Steel prices have been a lively subject for many years. They were just as controversial in 1895 as they are today (see cut). Steel was a lot cheaper then, of course. But evidently The IRON AGE editors of that day were quite disturbed by the "extremely wild" gyrations of prices.

How did we get onto this subject? Well, the Interstate Steel Co., of Evanston, Ill., used the price list from The IRON AGE as the focal point of an appeal that steel prices be held where they are.

Puzzler Answer

Apparently no one could crack the April 30 puzzler involving numbers and letters.

Here's the answer: You add 9 to 7 and get 16. Sixteen has a letter count of seven (S-I-X-T-E-E-N). The character count of the added numeral (N-I-N-E) is 4 which equals one-fourth the value of the first spelled out number—Sixteen.

Prices during a portion of the year were extremely wild, as will be shown by the following list:

JANUARY, 1895.

Refined Bars	1.15c. to 1.25c.
Ordinary Plates	1.25c. to 1.30c.
Angles	1.25c. to 1.30c.

And at the close of December the following prices were in force:

Grooved Skelp (Iron), delivered	1.30c. to 1.35c.
Standard Refined Bars, store (Iron)	1.45c. to 1.55c.
Refined Bars (Iron), delivered	1.30c. to 1.40c.
Tank Steel, delivered	1.50c. to 1.60c.
Universal Plates, delivered	1.55c. to 1.60c.
Shell, delivered	1.65c. to 1.70c.
Flange, delivered	1.75c. to 1.90c.
Angles, delivered	1.55c. to 1.65c.
Beams and Channels	1.60c. to 1.70c.

OLD MATERIAL.—The market has at times during the year been unusually wild.

BAR IRON.—Buyers are awaiting the beginning of 1896 before making their wants known. The mills, or many of them at least, are closed until the end of the holiday season. At the new price—1.25c., Cleveland—there were a few sales immediately following the Chicago meeting, but speculators immediately shaded these figures and now orders are being withheld until the mills resume business. Complaint is made that no matter what price is fixed upon by the association the jobbers are sure to make a lower quotation. We quote Steel Bars at 1.15c. to 1.25c. and Common Refined Bars at 1.25c., Cleveland.

OLD RAILS.—There are not wanting indications that after the beginning of the new year something may be done on the basis of $16.50 to $17 for Old Iron Rails, $13 to $13.50 for Old Car Wheels and $13 to $13.50 for Old Steel Rails.

IN A SQUEEZE?

HERE'S YOUR ANSWER
FOR PRECISION TUBING
AT REGULAR TUBE PRICES

Quality specifications and profit margins have you in a squeeze on tubing? Precision Tubing assures you unsurpassed quality of temper, straightness, accuracy, finish and roundness at regular mill prices . . . and test results prove it.

Whatever the type of alloy tubing you need from .010" to 1.125" O.D. in copper, brass, aluminum, up to ⅝" O.D. in nickel and nickel alloys, Ni-Span "C", phosphor-bronze and nickel silver Precision can supply it. Whether you need Bourdon, round, rectangular, oval or square . . . preformed to special shapes . . . or Coaxitube-Precision can supply it to your specifications.

For improved quality at lower costs specify Precision Tubing. Write for technical data to Dept. 10, Precision Tube Company, Inc., North Wales, Pa.

GET THIS NEW TUBING DATA CATALOG . . . FREE!

PRECISION TUBE COMPANY

Assembly costs cut 50% at design stage by Tinnerman **SPEED NUT**® Brand Fasteners!

Fastener ideas worked out between designers at Hillside Metal Products, Inc., and Tinnerman engineers, resulted in the selection of 3 different SPEED NUT types for Hillside's complete line of quality steel office furniture. Hillside estimates "at least a 50% saving in material costs, assembly time and tooling" over ordinary fastening methods. And spring-steel SPEED NUTS hold tight, even through years of hard service.

A special Dart-Type SPEED CLIP® snaps into a punched hole, securely anchors one end of the drawer latching mechanism spring. A standard Push-On SPEED NUT "bites" into a stud; prevents the other spring end plus latching bar from backing off. Desk tops as well as desk and table legs, are attached with the help of SPEED GRIP® Nut Retainers that snap into bolt-receiving position in punched holes. A Push-On completes the file drawer follow block assembly; two more secure each filing cabinet drawer card holder.

This should give you an idea of what a free Fastening Analysis can probably do for you in savings and improvements on present or new products. Look up your Tinnerman representative in the Yellow Pages under "Fasteners". Or write to

TINNERMAN PRODUCTS, INC.
Dept. 12 • P. O. Box 6688 • Cleveland 1, Ohio

TINNERMAN
Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

COMING EXHIBITS

Instrumentation Show — Sept. 21-25, International Amphitheatre, Chicago. (Instrument Society of America, 313 Sixth Ave., Pittsburgh 22.)

Metal Show — Nov. 2-6, International Amphitheatre, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

MEETINGS

JULY

Truck Trailer Mfrs. Assn.—Annual summer meeting, July 13-15., The Homestead, Hot Springs, Va. Association headquarters, 710 Albee Bldg., Washington, D. C.

Metal Lath Mfrs. Assn.—Meeting, July 21-22, Statler Hotel, Buffalo, N. Y. Association headquarters, Engineers Bldg., Cleveland.

Assn. of Roller & Silent Chain Mfrs.—Summer meeting, July 22-23, Grand Hotel, Mackinac Island, Mich. Association headquarters, 3343 Central Ave., Indianapolis.

SEPTEMBER

Pressed Metal Institute — Annual meeting, Sept. 13-17, Estes Park, Colorado. Institute headquarters, 3673 Lee Rd., Cleveland.

American Mining Congress—Metal mining-industrial minerals convention, Sept. 14-17, Denver, Colorado. Congress headquarters, 1200 18th St., N. W., Washington, D. C.

American Die Casting Institute—Annual meeting, Sept. 15-18, Edgewater Beach Hotel, Chicago, Institute headquarters, 366 Madison Ave., New York.

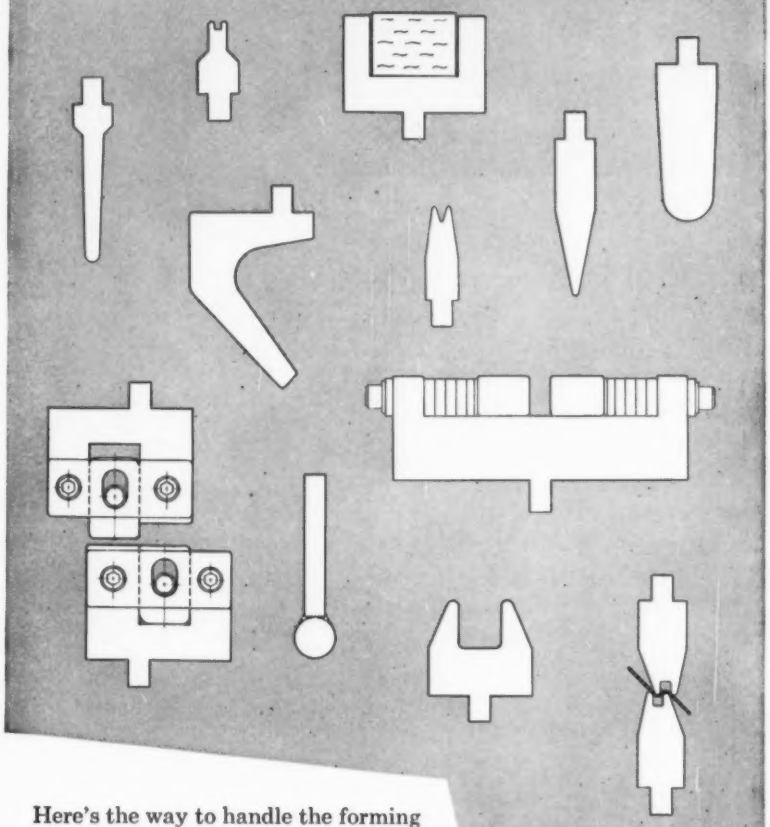
National Petroleum Assn.—Annual meeting, Sept. 16-18, Traymore Hotel, Atlantic City, N. J. Association headquarters. Munsey Bldg., Rm. 958, Washington 4, D. C.

Steel Founders' Society of America—Fall meeting, Sept. 21-22, The Homestead, Hot Springs, Va. So-

(Continued on P. 16)

Alloy Forming for
AIRCRAFT
MISSILES
ROCKETS
and
OTHER FABRICATIONS

CHICAGO®
ALLOY-FORM DIES
For All Makes of Press Brakes



Here's the way to handle the forming operations on the many alloys entering into the construction of aircraft, missiles, rockets, and other fabrications.

CHICAGO Alloy-Form dies are premium dies with superfine finish on the forming edges to prevent marring the polished material surfaces. And, the wear surfaces of the dies are induction hardened (approximately Brinell 500) for longer life without reworking. These dies will fit any make of press brake.

Illustrated are a few of the commonly used types available for prompt delivery. For further data ask for Bulletin AFD-958.

Complete recommendations and quotations on Alloy-Form dies or any special die upon request.

8706

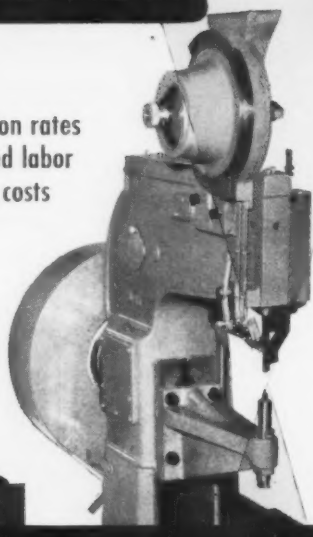
CHICAGO DREIS & KRUMP

DREIS & KRUMP MANUFACTURING CO.
7430 S. Loomis Blvd., Chicago 36, Illinois

Press Brakes • Press Brake Dies • Straight-Side-Type Presses
Hand and Power Bending Brakes • Special Metal-Forming Machines

Odd shapes are no problem for the new Townsend Model 75 Tubular Rivet Setting Machine

High production rates using unskilled labor cut fastening costs



Skillfully designed tooling gives complete versatility to the new Townsend Model 75 Tubular Rivet Setting Machine. A variety of specialized tooling is available to equip the Townsend machines for any size and shape of work.

Townsend tubular rivets are available in steel, aluminum, copper, brass, nickel-silver and special materials for use in joining anything from cloth to steel sheets. Thus, Townsend makes available the economies of tubular rivet fastening for a wide range of products in a number of different materials. Townsend's experienced fastening engineers provide application design service.

If you wish to enjoy the economies of fastening with tubular rivets, write for complete information on the versatile Model 75 Setting Machine and the complete line of Townsend tubular rivets. Townsend Company, P. O. Box 71-B, Ellwood City, Pa.

Townsend Company

ESTABLISHED 1916

Engineered Fasteners Division

ELLWOOD CITY · PENNSYLVANIA

Chesty Rivet Division · Santa Ana, California

In Canada: *Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario*

EXHIBITS, MEETINGS

(Continued from P. 15)

ciety headquarters, 606 Terminal Tower, Cleveland.

Electronic Industries Assn.—Quarterly meeting, Sept. 22-24, Plaza Hotel, New York. Association headquarters, 1721 DeSales St., N. W., Washington 6, D. C.

Porcelain Enamel Institute, Inc.—Annual meeting, Sept. 24-26, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 1145 19th St., N. W., Washington 4, D. C.

Association of Iron & Steel Engineers — Convention, Sept. 28-Oct. 1, Sherman Hotel Chicago. Association headquarters, 1010 Empire Bldg., Pittsburgh.

American Welding Society — National fall meeting, Sept. 28-Oct. 1, Hotel Sheraton-Cadillac, Detroit. Society headquarters, 33 W. 39th St., New York.

OCTOBER

National Assn. of Sheet Metal Distributors — Annual meeting, Oct. 4-7, Atlantic City, N. J. Association headquarters, 1900 Arch St., Philadelphia 3.

Truck Body & Equipment Assn., Inc. — Annual convention and exhibit, Oct. 5-7, Sherman Hotel Chicago. Association headquarters, 1616 "K" St., N. W., Washington 6, D. C.

American Gas Assn.—Annual convention, Oct. 5-7, Chicago. Association headquarters, 420 Lexington Ave., New York.

Society of Automotive Engineers—National aeronautic meeting, aircraft manufacturing forum and engineering display, Oct. 5-10, Ambassador Hotel, Los Angeles. Society headquarters, 485 Lexington Ave., New York 17, N. Y.

Gray Iron Founders' Society, Inc.—Annual meeting, Oct. 7-9, Fairmont Hotel, San Francisco, Calif. Society headquarters, 930 National City-E. 6th Bldg., Cleveland.

Quality in Ascendancy

The superiority of the vast number of products that are—and can be made from Roebling Cold Rolled Flat Spring Steel is a fact known throughout all industry.

You pay for mechanical and dimensional uniformity when you buy flat spring steel...you *get* it when you buy Roebling.

For information on how our products can help *yours*, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities

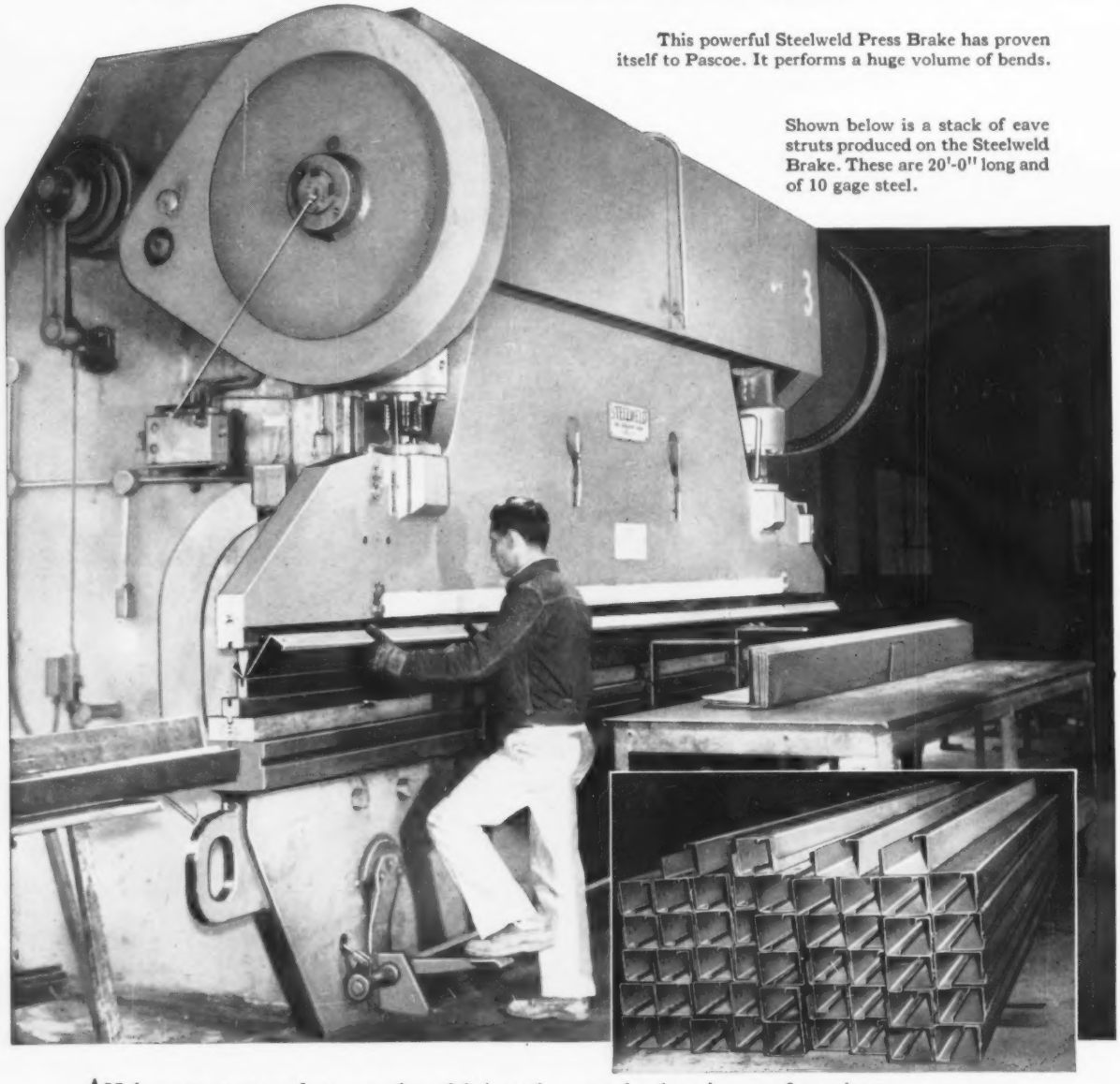
Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it

STEELWELD BRAKE
AIDS PASCOE BUILDING PRODUCTION

This powerful Steelweld Press Brake has proven itself to Pascoe. It performs a huge volume of bends.

Shown below is a stack of eave struts produced on the Steelweld Brake. These are 20'-0" long and of 10 gage steel.



AN important manufacturer of prefabricated steel buildings on the West Coast, the Pascoe Steel Corporation, Pomona, California, keeps their Steelweld Press Brake going full tilt in order to keep up with the production schedule.

The brake normally handles steel up to 20'-0" x 3/16", although occasionally 1/4" metal is formed. It has the speed and power to produce sharp accurate bends at a fast rate.

Despite all the work put through, only the meagerest amount of maintenance is required. For instance, the clutch has had to be adjusted only once, every eight-month period and this can be done in very few minutes.

Pascoe builds a complete line of pre-engineered buildings which are used for warehouses, light manufacturing, grain storage, auditoriums, aircraft hangers, etc.

Write for free copy of catalog No. 2023A

STEELWELD

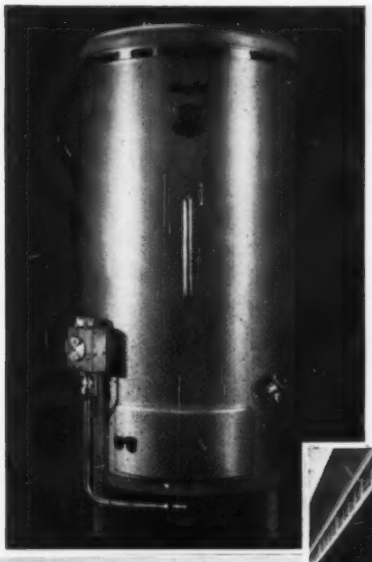
Mechanical and Hydraulic

PRESS BRAKES

Steelweld Machinery includes: Mechanical & Hydraulic Shears and Press Brakes, One-, Two- and Four-Point Straight-Side Presses, Speed-Draw Presses.

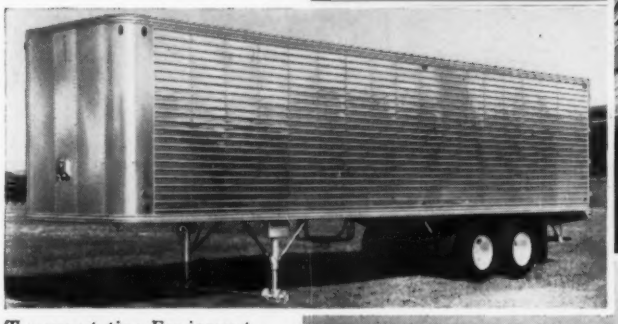
THE CLEVELAND CRANE & ENGINEERING COMPANY • 4873 EAST 281ST STREET • WICKLIFFE, OHIO

When aluminum is part of your product . . .



Appliances

Building Materials



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Bridge Railing

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If your product demands aluminum to exact specifications—and you're not getting it—call on Anaconda!

Custom production, combining precision control of the most modern equipment available with the craftsmanship of aluminum experts, assures you that Anacónda Aluminum always matches your product specifications precisely. And the flexibility of our modern plant facilities gives your orders fast action, prompt shipment.

Talk over your requirements for pig and ingot, coiled and flat sheet, extruded shapes, structurals, rod, bar and tubular products now with your local Anaconda Aluminum representative . . . or write our General Offices, Dept. IA-7, Louisville 1, Kentucky.

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EVERY INDUSTRY HAS ONE MEMBER
WHO SPECIALIZES IN CUSTOMER SATISFACTION

ANACONDA ALUMINUM

ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE, KENTUCKY

Republic High-Performance

STAINLESS STEEL IS USED IN LEADING EDGES of the 880's vertical fin and horizontal stabilizer where anti-icing is accomplished through electrical heating of the metal. Use of Republic ENDURO Stainless Steel increases strength and heat-resistance, permits thinner, lighter gages. Types 301 and 302 are readily formed into desired shapes by cold-forming, drawing, and bending operations. Mail coupon for complete details.

In the Convair 880—the world's fastest jet airliner—speed, economy, and medium-range operating requirements dictated the use of thousands of pounds of *high-performance* metals. Working closely with design engineers, Republic Steel supplied:

TITANIUM to increase strength-to-weight ratios . . . permit lighter weight with increased strength.

ENDURO® STAINLESS STEEL to increase heat and corrosion-resistance at elevated temperatures.

ALLOY STEEL to increase strength of major structural components . . . provide an extra margin of "beef."

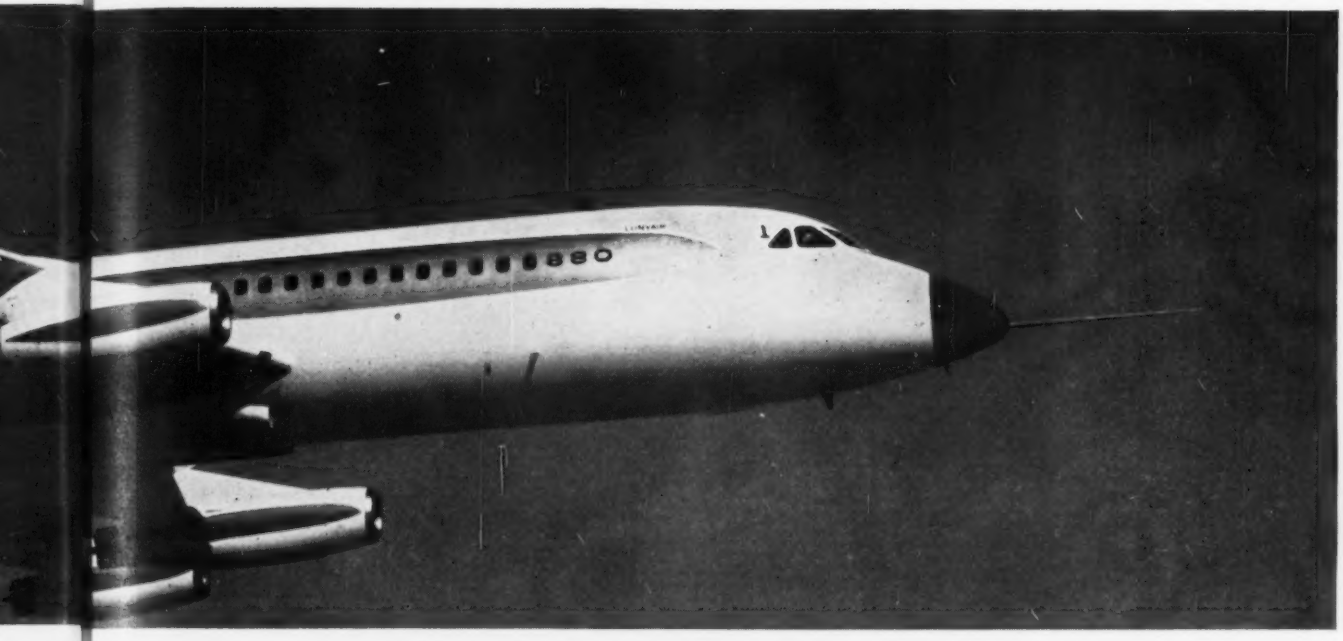
Republic has pioneered in the development and production of new metals to increase strength, resist heat, reduce weight. With constantly expanding research as well as production facilities and capabilities, Republic is the nation's largest producer of *high-performance* metals —titanium, stainless, and alloy steels.

Let us help you find the most advantageous uses of these metals in *your* project. Return the coupon for complete information without obligation. Please indicate if you would like a Republic Metallurgical Specialist to call.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels



Metals for the 880

IN EACH 880 POD-PYLON, rear engine mount "horseshoe" frame—of nickel-plated, chrome-alloy steel—grips the powerful General Electric CJ-805-3 engine. Republic Alloy Steels offer exceptionally high strength-to-weight ratios with the highest strength values. Uniform response to heat treatment assures complete deep hardening penetration, plus hard, wear-resistant surfaces. Send for additional information.

REPUBLIC'S NEW HIGH-STRENGTH POWDER, TYPE HS6460,

is ideal for sinterings of highly stressed components. Provides minimum tensile strength of 60,000 psi at 6.4 density as sintered . . . 100,000 psi after heat treatment. Less than .004% shrinkage from die size at 6.4 density. Available in quantities up to and including 12 tons or multiples. Can be used with existing operating equipment. Mail coupon for technical data sheet.

MAJOR 880 TITANIUM USES are (1) fixed outboard nacelle assembly—107.8 pounds per nacelle, 215.6 pounds per airplane; (2) lip assembly anti-icing nose cowl—53.8 pounds per nacelle, 215.2 pounds per airplane; and (3) right hand access door assembly—41.2 pounds per nacelle, 164.8 pounds per airplane. Republic supplies a major portion of the 870 pounds of titanium that goes into each Convair 880.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. IA -7818
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Have a metallurgist call:	Send more information on:
☐ Alloy Steel	☐ Alloy Steel
☐ Stainless Steel	☐ Stainless Steel
☐ Titanium	☐ Titanium
☐ Type HS6460 Metal Powder	☐ Type HS6460 Metal Powder

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Address_____

City_____ Zone_____ State_____

Use your AIM*... Simplicity Engineering does...

Steel Strapping cuts 4 hours off bracing time

Acme Idea Man Harold Schultz helps many companies develop better shipping and packaging methods.

SIMPLICITY ENGINEERING, INC., DURAND, MICHIGAN builds specialized screens, feeders, conveyors and shake-outs. In-transit security of these heavy products (up to 11 tons each) was a major concern until their Acme Idea Man helped them develop an Acme Steel Strapping technique that reduces work and assures safe transit. (Idea No. U2-6)

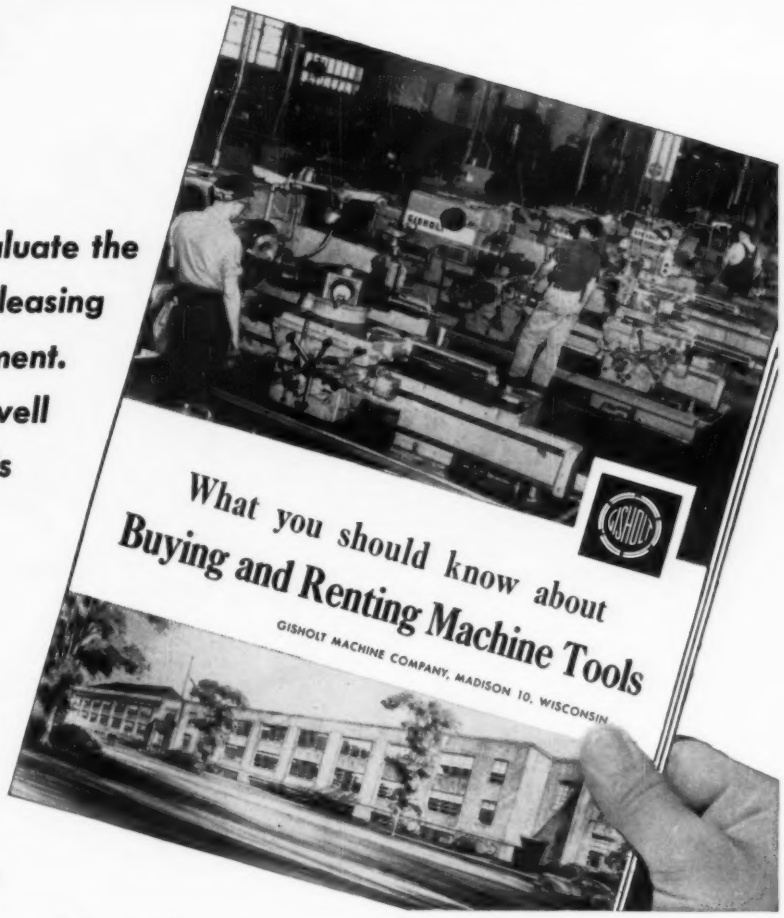
In addition to providing lading security, the use of heavy-duty steel strapping for tie-downs gives added benefits: cars are now loaded, braced and secured in 4 hours less time than formerly needed; material costs are reduced; and loading crews find the job easier.

***Use your Acme Idea Man.** He will work with you toward improved packaging and shipping methods. Call him at your nearest Acme Steel Office, or write Dept. IFU-79, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Limited, 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**

Can your competitors turn metal at lower costs?

***Now** is the time to re-evaluate the possibilities offered by leasing of new production equipment. Your decision today can well determine your company's position in tomorrow's competitive market.*



This free booklet tells how you can get new machines with minimum capital outlay

If you have delayed replacing old machines because of the relatively large capital investment, acquisition by methods other than outright purchase may solve your problems. Only a minimum initial investment provides you with the many competitive advantages that new machines offer, including greater accuracy, higher production rates and faster setup. New features and accessories simplify even the toughest jobs. Secondary operations are minimized and spoiled work becomes a thing of the past. All this means lower unit cost—more profit for you.

If you want the benefits that new machine tools can provide, and if you like the idea of letting them "pay their way" while they "turn" a profit for you, you'll want to write for Gisholt Bulletin 1173 on buying and renting machine tools. It fully explains one of the most liberal and comprehensive policies in the industry, and covers several types of leasing and time payment plans with vital information on depreciation, tax angles, the MAPI formula and other timely questions. The coupon will bring your free copy. Send it along today.

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE

Gisholt Machine Company
1215 E. Washington Ave.
Madison 10, Wisconsin

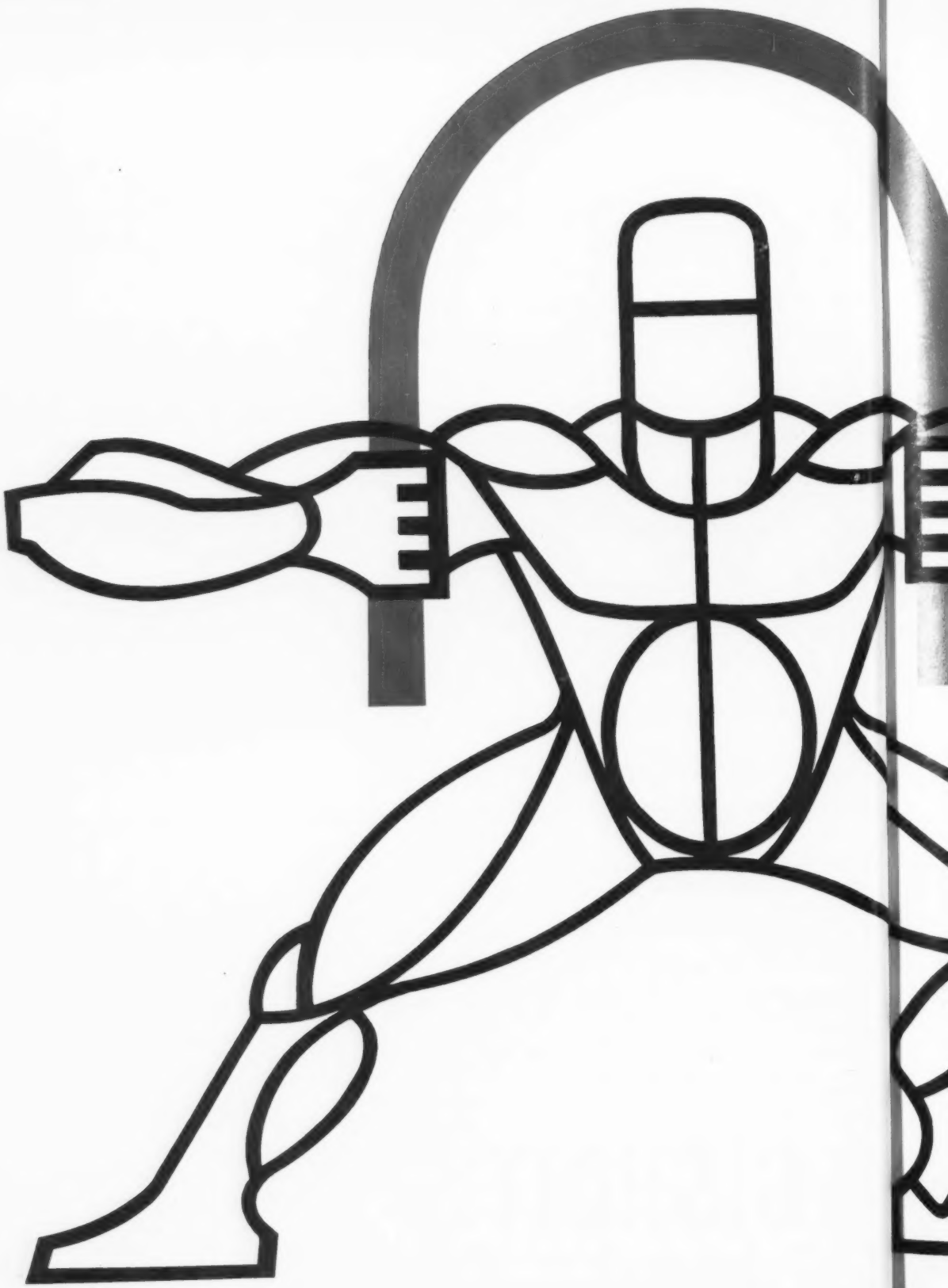
Without obligation, please send your Bulletin 1173.

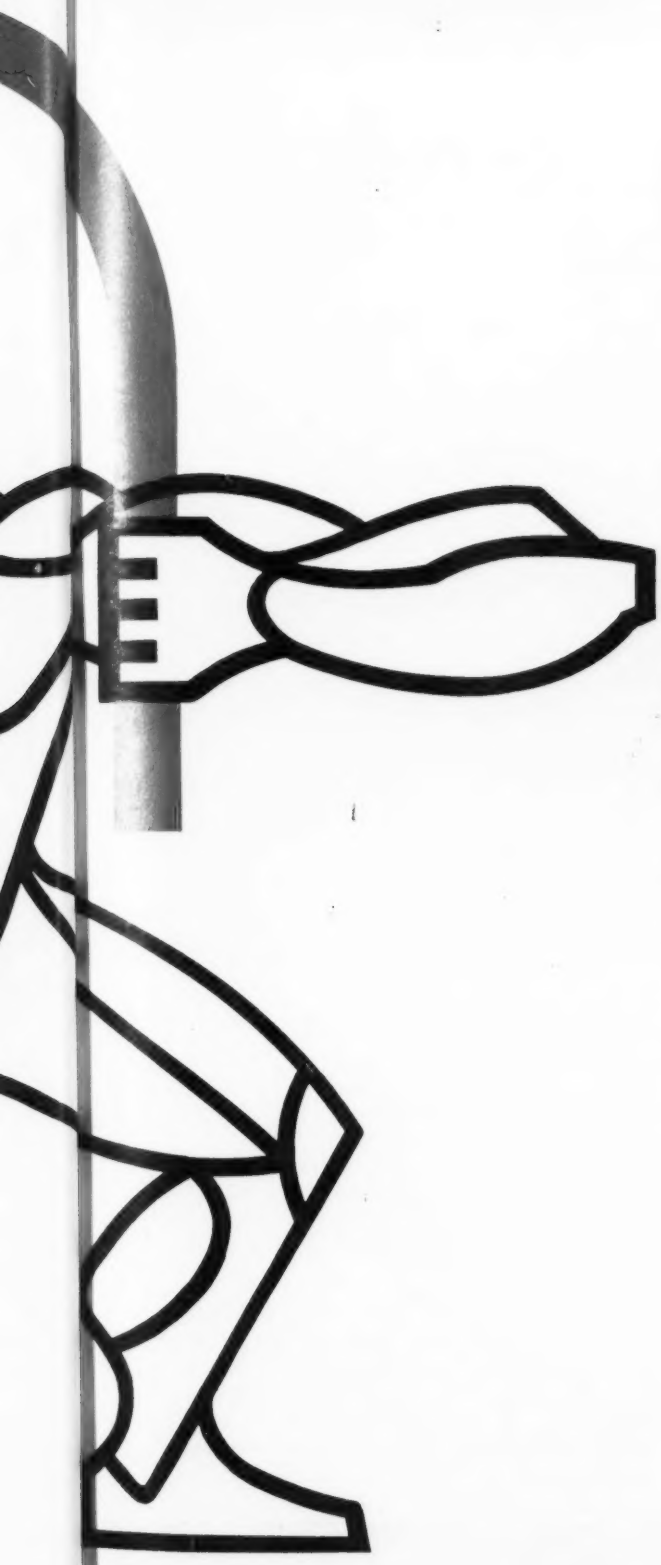
Name.....*Title*.....

Company.....

Street address.....

City.....*Zone*.....*State*.....





NOW... SUPERIOR FORMABILITY IS AVAILABLE IN AN EXTRA-STRENGTH STEEL

N-A-XTRA

BEST LOW-ALLOY EXTRA-STRENGTH STEEL YOU CAN BUY

N-A-XTRA HIGH-STRENGTH is a heat-treated steel now available in minimum yield strengths of 80,000-110,000 psi.

Unlike most steels of this strength and toughness, N-A-XTRA can be cold formed into difficult shapes, gas-cut, sheared, machined, and otherwise handled by conventional fabricating methods. It has superb weldability—by any process. And its great strength gives designers and engineers a unique opportunity to eliminate useless dead weight from finished products.

For complete information on N-A-XTRA—the best low-alloy extra high-strength steel you can buy—write Great Lakes Steel Corporation, Detroit 29, Michigan, Dept. A-9.

N-A-XTRA

GREAT LAKES STEEL

A DIVISION OF NATIONAL STEEL CORPORATION

30% TO 50% LONGER LIFE FOR RESINOID-BONDED DIAMOND WHEELS

Six hundred separate trials, using 145 wheels, were run by the Diamond Research Laboratory to test a completely new type of natural diamond grit for resinoid wheels. The results: this new grit increases the life of natural diamond resinoid-bonded wheels by 30% to 50%.

The particles of this new grit do not readily pull out of the bond. Instead, they break down into ever-finer fragments which constantly expose new, sharp cutting surfaces.

TEST EQUIPMENT: Three 18" Jones & Shipman production grinders were fitted with special spindles to enable wheels to operate at 5500 surface feet per minute, the speed generally used in diamond grinding.

The wheels were of the D1A1 type, 6" in diameter, 3/16" face width, with 1/8" depth of resin. Each wheel contained 31 1/4 carats of the new grit. Metal to be ground was tungsten carbide of the same quality normally used for milling cutters, lathe tools, etc. During the course of the tests, 700 pounds of hardest carbide were ground away.

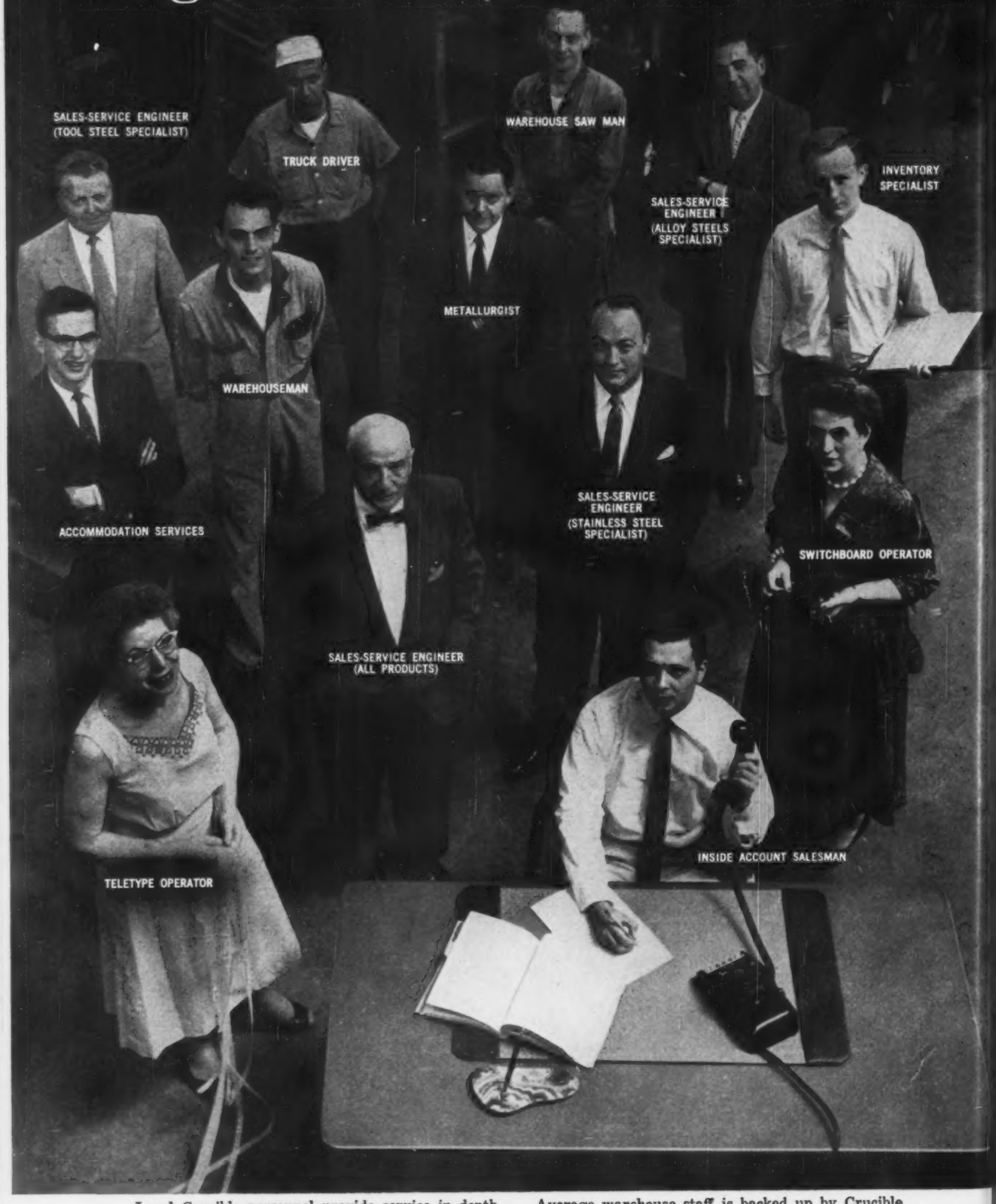
RESULTS: This new friable grit, Selected Natural Diamond (SND-RESINOID), increases the life of natural diamond resinoid wheels by 30% to 50%, depending on the type of job at hand. The grit will be available to your wheel manufacturer soon. Next time you order diamond resinoid wheels, specify SND-RESINOID . . . the most economical *and* the most efficient grit you can use.

Tests were run on these three Jones & Shipman production grinders. Results showed that the new grit, Selected Natural Diamond (SND-RESINOID), increases the life span of natural diamond resinoid wheels by 30% to 50%.

INDUSTRIAL DISTRIBUTORS (SALES), LTD.

YOU CAN DEPEND ON NATURAL DIAMONDS

integrated CRUCIBLE steel service



Local Crucible personnel provide service in depth, ranging from quick reports on steels available to expert assistance with metal working problems.

Average warehouse staff is backed up by Crucible Metallurgists who, although located at mills, will travel.

maintains broad range of local customer services

– ranges from in-stock deliveries to metallurgical research

Here's *service in depth*, made possible by Crucible's integrated operation. It starts with in-stock deliveries of the steels you need and goes on to provide complete technical assistance for engineers, production, toolroom and maintenance men. And the entire service is available from all of Crucible's 31 warehouses –

(1) *Deliveries from local stocks* of 16,000 specialty steel items, including all grades, shapes and sizes.

(2) *Basic specialty steel data* – complete breakdowns on properties, characteristics, as well as machining and fabrication details. (Warehouse account salesmen can frequently recommend the best steel for the end use.)

(3) *Metalworking assistance* with unusual machining and fabricating problems – by trained, experienced sales-service engineers who specialize in tool steels, stainless, alloys.

(4) *Metallurgical research* – help in developing steels for tomorrow's more exacting applications from Crucible's metallurgists, who will come to your plant on call.

Here's what one purchasing agent recently had to say about this over-all service: "We need lots of help with new steels – ones we haven't used before. The reason we rely on Crucible warehouses is because their men know the answers – or can get them for us quickly."

Why not simplify your own specialty steel purchasing problems by taking advantage of this integrated service? *Crucible Steel Company of America, Dept. PG-06, Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

STOCK LIST

Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

Crucible metallurgists will come to your plant, if necessary, to help engineers use new steels or metals like titanium.

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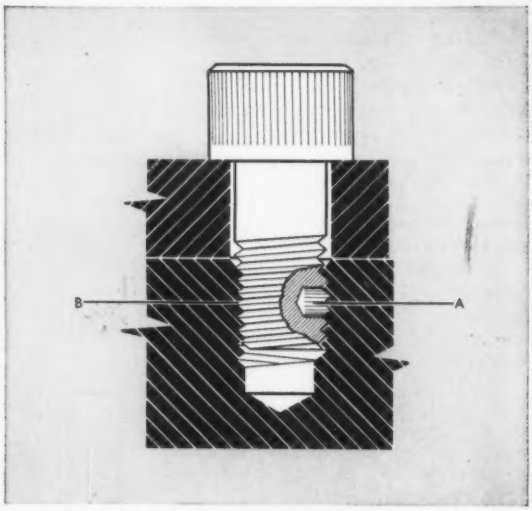
UNBRAKO socket screws with Nylok* reduce costs and production time

Self-locking UNBRAKO socket screws, in a full range of standard types and sizes, are stocked by your authorized SPS distributor. Permanently installed locking pellets are serviceable from −70 to +250°F and will not dry out, rot or shrink, are not affected by age or fungus.



How Nylok locks: Resilient nylon pellet (A) sets up lateral thrust, smoothly wedging mating threads together (B). Locking action is entirely on threads and is positive, seated or unseated. UNBRAKOs with Nylok are easy to remove and are reusable.

Regular screws loosen under vibration because external stresses cause marked variations in screw tension, resulting in motion between mating threads and loss of frictional holding power.

UNBRAKO socket screws with Nylok stay put, because they do not depend on screw tension to keep them tight. Here is how they work: A tough, resilient nylon pellet, inserted permanently in the threaded section of the screw, is the locking medium. Before assembly, the locking pellet projects slightly beyond the crest of the thread. When mating threads are engaged, it is compressed. Its springlike wedging action grips threads tightly and sets up a counterthrust, creating a strong metal-to-metal engagement of the mating threads. Locking is positive whether the screw is seated or not. And the permanently installed nylon locking pellet retains strength characteristics from −70 to +250°F.

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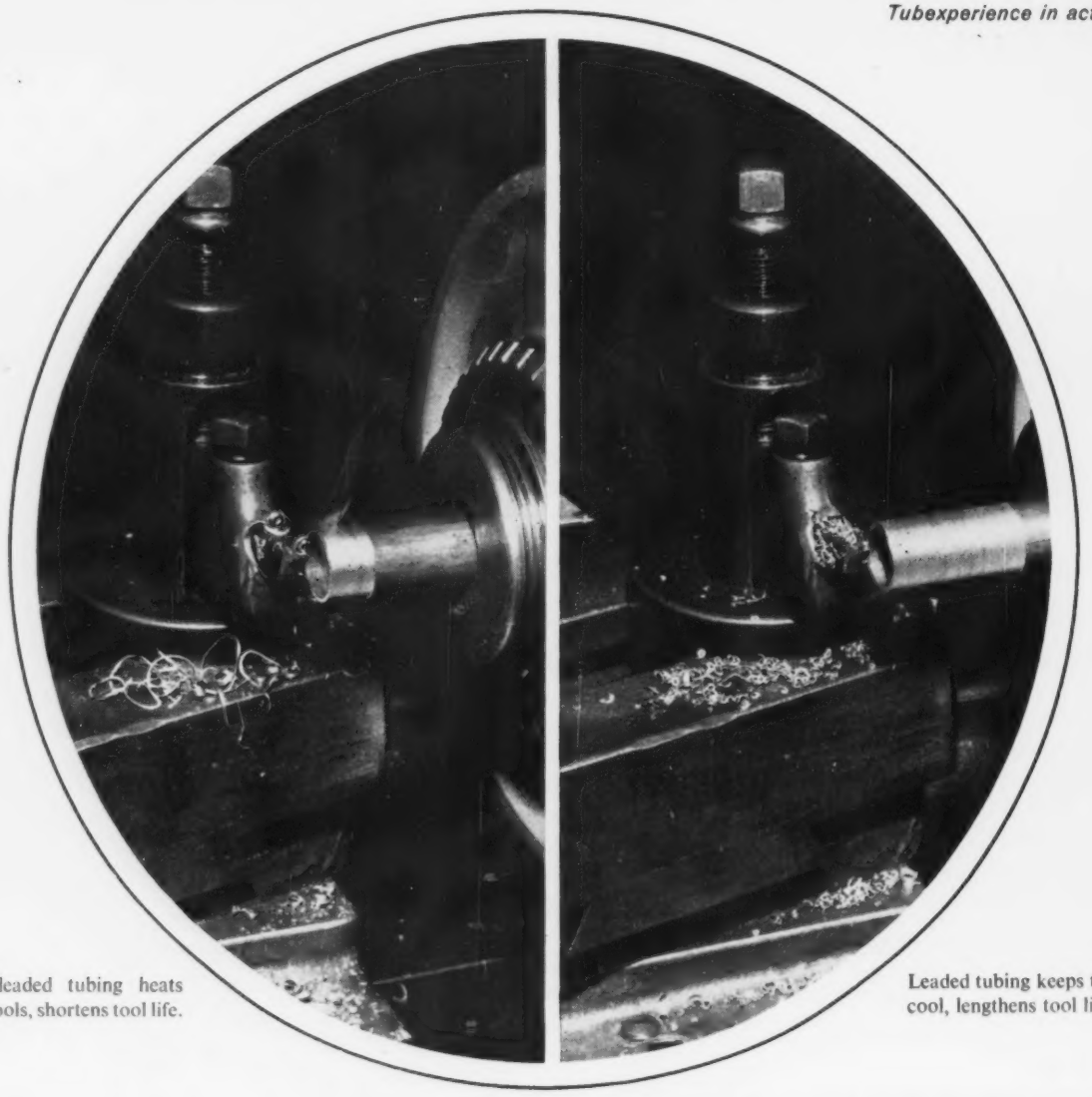

Nonleaded tubing heats up tools, shortens tool life.

Leaded tubing keeps tools cool, lengthens tool life.

Now Superior Carbon Steel Tubing with Built-in Lubrication

New leaded 1020 tubing permits faster speeds and heavier feeds, often reduces the number of finishing operations

Where machinability is of major importance, specify Superior Seamless Leaded 1020 Tubing. Its built-in lubrication permits faster speeds in turning, drilling, tapping, milling, grinding and other machining operations, provides an 18% increase in feeds, and often reduces the number of finishing operations required to produce a smooth, lustrous surface. Build-up of metal at the cutting edge of the tool is minimized. Chip formation is improved. Tools operate at lower temperatures, last longer, and require fewer dressings. Lower tool cost is an accompanying benefit. Another is reduced downtime for replacement of dull and wornout tools. There is virtually no difference in physical and mechanical properties between leaded and nonleaded carbon steel tubing. So the grades are interchangeable.

Superior Seamless Leaded 1020 Tubing is available in a range of ODs from .012 through 1⅛ in. For particulars, send for Data Memorandum No. 24. And remember that other small-diameter tubing is available in more than 120 analyses, meeting a very broad range of applications. Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

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All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

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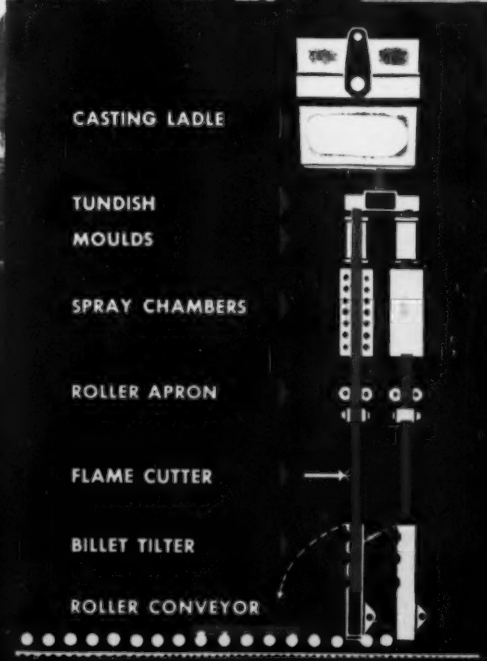

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Developed to the Junghans system in co-operation with Messrs. Mannesmann and Böhler

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THE

PRESSURE ON PRICES IS UPWARD, say industry experts. Based on past experience, they look for industrial prices to go up about 7 pct before the year is out. They say amount of the increases will depend on outcome of industrial labor contract talks.

BUT CURRENT PRICE STABILITY is contributing to the country's prosperity. Government figures show that workers are taking home nine per cent more spending money than a year ago. And they're using it to buy things, mainly consumer durables.

MOBILE HOMES ARE A GROWING MARKET for metals and metalworking. About 3.5 million people live in homes on wheels now, and the figure could well hit 21 million by 1970. The average mobile home family makes $5300 per year--and it's moving up.

CONSTRUCTION BOOM shows no sign of let-up. F. W. Dodge reports continued gains in housing, manufacturing, and commercial building. Figure for May was $3.5 billion, up 4 pct over 1958.

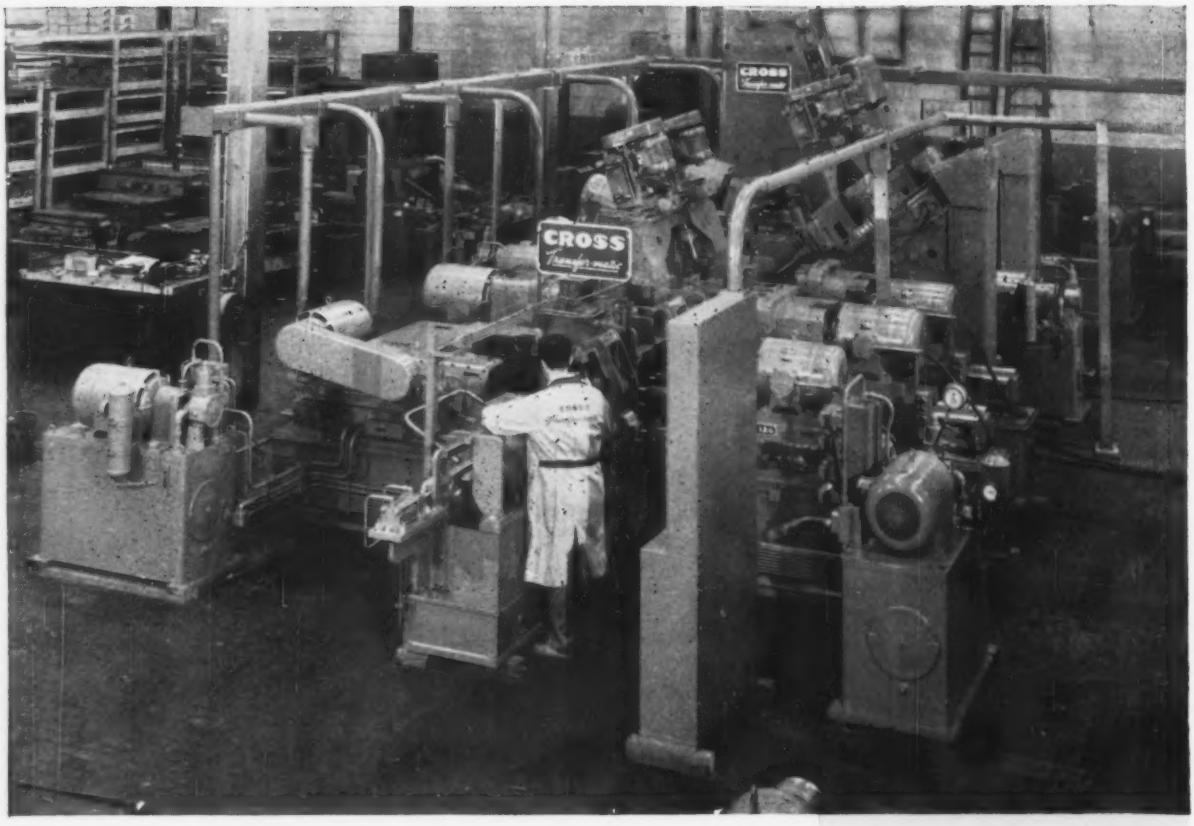
USERS OF VITREOUS ENAMELING sheet will soon have an entirely new product to test out. Developed by Bethlehem Steel, it's now in pilot plant production. Commercial output is scheduled to start late this year. It will bear a competitive price tag.

HIGHWAY BUILDING NEEDS will provide a strong market for metalworking products for the remainder of 1959. This is the outlook regardless of what Congress does about dealing with the federal share of highway financing.

MICHIGAN IS FIGHTING for its share of defense contracts. It's surveying 3000 Michigan companies to see whether they really know how to go about obtaining defense business. The state's share of military business has dropped from 6.4 pct earlier this year to 3.2 pct.

FREIGHT CAR BUSINESS is gathering steam. Order backlogs as of June 1 were 36,869 cars. This was an increase of about 4 pct over those of a month earlier, and compares with 30,386 on order as of June 1, 1958.

STEEL MILLS ARE OFF on a hot strip mill kick. Before they're through, it's estimated they will have spent a half billion dollars or more to replace, modernize, and add mills. Three new mills were started in '58; four major projects have been announced this year; at least two more are in the works.



Why Cross chose Timken® bearings for all 148 drill spindles

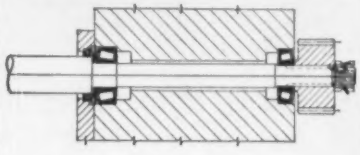
THIS huge Cross Transfermatic drills and taps holes in automobile engine blocks at new highs in speed and accuracy. To assure maximum user economy and machine life, Cross engineers chose Timken® tapered roller bearings for the machine's 148 drill spindles. Here's why:

1) *They maintain precision longer.* Timken bearings are geometrically designed to give true rolling motion, precision manufactured to live up to their design.

2) *They're extra tough* because Timken bearing steel is nickel-rich and to make sure it's the finest quality, we make it ourselves . . . America's only bearing maker that does.

When you use a machine with Timken bearings, you get all the *extra* benefits of Timken Company leadership in tapered roller bearing design and in engineering service. We maintain the industry's most modern laboratory to test bearing applications. To get better machines, make sure they're Timken-bearing-equipped. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

How **THE CROSS CO.** mounts 148 drill spindles of its Transfermatic on Timken bearings to give longer bearing life, maintain accuracy.



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tapered roller bearings

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Industrial Price Boosts Loom As Cost Pressures Mount

On the basis of long-term trends, industry experts look for sharp price rises this year.

Outcome of labor contract talks in major industries will have a bearing on amount of rise.—By G. J. McManus.

▪ Along the whole industrial front, prices are ready to lunge upward. Trend lines extending back through 1947 point to one of the sharpest price surges in recent years. Reports from individual companies show strong pressure for higher prices.

Steel Is the Key—Big question-mark in the picture is steel. Purchasing agents ask themselves: 1. Will steel producers be able to hold the price line? 2. If the mills can apply a freeze, will prices of other commodities stay put?

It is too soon to measure the direct and psychological effects of steel developments. Labor talks in aluminum, copper, and rubber must also be considered. But unless a complete new pattern can be set, dopesters look for a general wave of price increases. (See chart below)

Time Is Ripe—They point out that industry went through 1958 with prices clamped down by hungry competition. Now business is improving while costs continue to climb. Companies are primed for a price push.

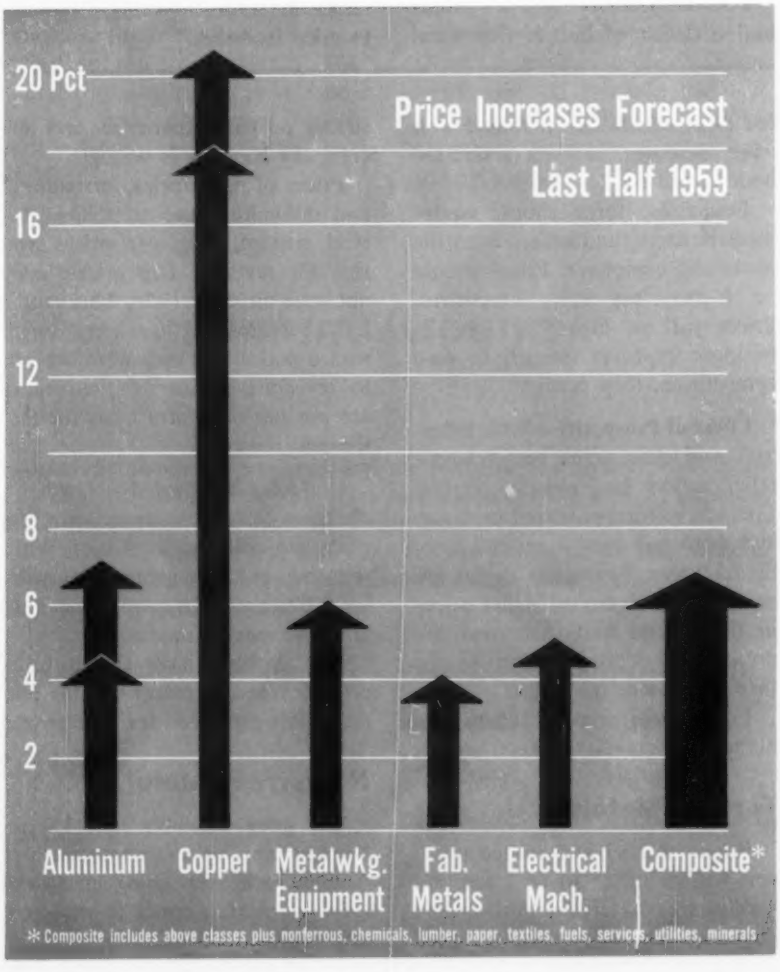
Under similar conditions in 1955, prices of major industrial commodities jumped more than 6 pct after rising only 1.8 pct in the 1954 recession.

Average Rise Expected — One forecast now calls for prices of 15 industrial staples to rise an average of 6.5 pct in the next six months. Fuels, metals, machines, and services are seen moving up. The composite rise figures to equal any since 1951 and to top those of the past three years.

Backing these figures are statements of industrial leaders. D. A. Rhoades, vice president and general manager of Kaiser Aluminum & Chemical Corp., said last month aluminum prices should go up even if there were no wage increase.

Upward Pressures—Mr. Rhoades

Prices: The Trend Is Up



Pressures Pushing Prices Up

There are danger signs, says the President's Committee on Price Stability, that price rises are coming.

The Committee, headed by Vice President Nixon, has just released its interim report. In it these trends threatening price stability are noted:

Wholesale Price Increases—"Prices of industrial commodities and many other goods have been rising in wholesale markets and this is usually followed by rises at (the) retail (level)."

Consumer Price Advances—"While the average level of consumer prices has been relatively stable, prices of many consumer goods and services have continued to go up. . . ."

Federal Deficits — "The multi-billion deficit of budget (for fiscal '59) is creating sizable inflationary pressures."

Federal Spending—". . . Prospects for holding the line on expenditures (for fiscal '60) appear much brighter . . . (but) there still remain strong pressures for irresponsible spending."

Local and State Spending—"There are strong tendencies toward increased spending by state, county, and local governments."

Wage Settlements—"Wage settlements have been made which raised wages substantially; wage agreements negotiated earlier provide for increases this year; and wage agreements to be negotiated this summer or autumn in many industries (including steel and aluminum) could result in wage increases (leading) to price increases."

felt past reductions, combined with wage increases, had left aluminum underpriced by 2¢ a pound.

Foundries, forge shops, equipment builders, and others echo the aluminum complaint. Prices should be higher, say sales executives. Prices will go higher as soon as business improves enough to ease competition, they predict.

Effect of Prosperity—With industrial production hitting record levels, relief action has already started. There have been scattered increases and there has been a general firming of prices. Purchasing agents are being told to figure on higher prices in the second half. Salesmen are preaching a doctrine of firm prices, take it or leave it.

For various product groups, the outlook is something like this:

Ferrous Metals

Prices of steel and related products will go up $5 to $6 a ton, according to one large manufacturing concern. The forecast is based strictly on past experience, and the company hopes it is wrong.

Prices of refractories, ferroalloys, and dolomite figure to follow the steel pattern. Iron ore prices are ripe for revision. Ore prices have not gone up since 1956. This year's Lake Superior schedules were issued with a notice that they were subject to revision. Ordinarily, ore prices are put out on a firm basis for the shipping season.

Outlook Complicated—New beneficiation techniques complicate the price outlook for iron ore. With sintering plants coming into wide use, differentials between fine and lump ore may be modified.

Iron castings have shown little price firmness in recent months but there is pressure for increases.

Nonferrous Metals

The price timetable calls for an 8 pct increase in nonferrous metals. Aluminum is seen going up 1¢ to 1.7¢ a pound. Copper is expected to rise more than 6¢ in the next six months, on the basis of long-term trends. Outcome of labor contract talks will be a big factor.

Against Trend — Magnesium is one of the few metals to go against the general trend. Purchasing men look for reductions in magnesium prices. If price curves of recent years hold true, the metal is seen moving more strongly into competition with aluminum and even steel.

Electrical Equipment

Taking the full range of electrical machines, a price increase of 5 pct is seen for the next six months. Much of the electrical industry is tied to long-term labor contracts. Westinghouse Electric Corp. was hit with two cost-of-living increases this year. Its basic wage rates go up in October.

The timing and size of electrical increases may vary with market conditions. For fractional horsepower motors, the last general increase was in 1957. Motor prices declined about 10 pct last year. Now, with sales up and rising, price action seems certain.

Purchasing men hear the price increase will come July 15.

Apparatus Competitive — Heavy electrical apparatus is still in a competitive period but price increases are likely.

Fabricated Metals

Stampings, bearings, and other fabricated items are due to go up 4 pct in the next six months. In some lines a firming of prices has already increased costs for users. Bearing manufacturers, for example, have sent out letters to distributors and plants, spelling out the differences in resale and original equipment price schedules.

Prices of miscellaneous forgings have likewise started to stiffen.

Makers of valves, meters, and related products say there have been no general increases for the past year and a half and that unofficial price cutting is still widespread. One manufacturer feels the immediate price future is tied to steel.

Metalworking Equipment

Form sheets show prices of metalworking equipment going up 6 pct this year. Two leading manufacturers increased prices of turret lathes in the past 60 days. Purchasing men say machine tool salesmen are battling for an end to cut-throat pricing. Buyers are still getting last-minute concessions but there is clear evidence of firmer pricing. Two major lathe makers—Gisholt and Jones & Lamson—increased the prices of turret lathes in mid-June.

Mill Machinery—A similar process is taking place in steel mill machinery.

"Prices are getting stronger every day," says one large supplier. A mill purchasing agent reports the same trend.

Imports

Improved business could change the price attitudes of importers in a hurry. Traditionally, the swing from a slack to a tight market has seen imported products move from the bargain to the premium class.

There is no clear indication this is happening yet. Prices recently rose on the Brussels steel market. Galvanized sheet is no longer being offered at bargain prices in Pittsburgh. On the other hand, British steel prices were recently cut.

What Traffic Will Bear—At present, oil country seamless pipe is being sold in South America by European mills for 6 pct under delivered prices of American steel. Foreign pipe can be bought in Houston for less than the domestic price.

In 1954, similar conditions existed. Foreign seamless was selling for 10 pct under domestic prices. As conditions improved in 1955 and the first half of 1956, importers matched domestic increases and eliminated differentials. By July of 1956, imports were even with domestic prices. Then came the steel strike and prices of imported pipe shot up above the American level.

Alcoa in Britain

▪ Imperial Aluminium Co., Ltd., is a good reminder that there's more than one way to skin a cat.

The company is to be set up by Aluminum Co. of America (49 pct) and Imperial Chemical Industries, Ltd., (51 pct) to fabricate aluminum for sale "particularly in the United Kingdom and British Commonwealth markets."

It marks Alcoa's second attempt to get its foot in the door to the vast untapped potential of the European market. The first time the American producer thought it had an interest in British Aluminium just about signed, sealed and delivered, it discovered the source that had been quietly buying up BA stock the previous year was Reynolds.

Rate Market High—Alcoa's comeback with another entry to Britain so rapidly (Reynolds' BA control was clinched in early January) is a good indication of the potential the company sees in this market.

It is even more so, since Alcoa International has been far from idle during that time. Last month the Japanese government approved its partnership with Furakawa Electric Co., Tokyo, in a Japanese aluminum mill.

New Company—Imperial Aluminium will take over the rolling mills now being operated by ICI's metals division. ICI views this as advantageous because it feels Alcoa's mill techniques are among the best in the world.

The new company also forms a good base for expanding output and markets. John Mitchell, president of Alcoa International, said, "All the elements for a great and growing market are present in the United Kingdom and the new company should achieve the full potential."

S. P. Chambers, deputy chairman of ICI, said, "If you take the long distance view, we hope it will be not only a profitable, but an expanding venture."

U.S. Aluminum Around the World

Domestic aluminum producers feel the world is their oyster. But to tap the untapped potential for aluminum in many countries, a U. S. producer almost has to make it or fabricate it right there.

It's changing rapidly. But here's the current picture of the international interests of U. S. producers—countries where they own at least part of a smelter or fabricating plant:

England	Germany	Canada	Domin. Rep.
Alcoa	Reynolds	Reynolds	Alcoa
Reynolds	Japan	Colombia	Surinam
Mexico	Alcoa	Reynolds	Alcoa
Alcoa	Philippines	Cuba	Venezuela
Reynolds	Reynolds	Reynolds	Alcoa

New Look in Steel Bargaining

Industry Leaders Say "No" and Make It Stick

Steel companies' firm stand takes union leaders off guard. It could usher in a new era in steel labor relations.

Industry is fighting to restore wage-price stability and its lost prerogatives.

But the price in labor unrest could be high.—By Tom Campbell.

1959's Union-Management Crisis

▪ There is a new type of collective bargaining in the steel industry. It is not "Boulewarism." But it is quite different from recent years.

(The term "Boulewarism" stems from a General Electric bargaining technique whereby management makes a single basic offer and adheres to it throughout negotiations.)

The goal of this new type of bargaining is to regain some of the ground lost in recent years. The type of men who are leading this attempted parade back to wage-price sanity are not what the union chooses to call the "older" types.

The Bargainers—The mere fact that this movement is now underway in steel is no guarantee that it will work. In truth, the makeup of most of the new-type bargainers is heavily weighted toward the engineering and lawyer pattern. There is not a steelmaster among them.

Proof that there is a new kind of bargaining underway is found in what has happened at the Roosevelt Hotel in New York during the last two months. The steel side has said "no" to everything the union said or asked. This was a calculated move and is the core of the new type of bargaining as it now shows up.

Cooper's Role—The tough job of carrying out this new strategy fell to R. Conrad Cooper, U. S. Steel vice-president. That his job was tough was clear to any one who watched closely his day-to-day reports.

In simple fact, this new type of bargaining produced the most unusual: It caused Steelworker chief Dave McDonald to at least make two wage offers. True, they were far from what the industry expected or was prepared to entertain seriously, but they were bids for settlement. This is something that has come from the union only once in all the previous years of bargaining.

There is another strong factor in the new bargaining pattern:

A strong effort to meet the union head-on with the press. This has been checking and underlining all union claims which the industry deems to be incorrect.

No Overnight Victories — But there is another factor which makes the steel industry bargaining pattern a little difficult. This is an apparent effort to make up quickly what has been bargained away in the past 18 years. To say that "it" has been given away is being a little bit hard on past negotiators. But after all, the steel companies signed the contracts.

Although there has been pressure on steel companies in past settlements, collective bargaining did take place. Maybe the steel industry gave up too much. But some of the very members of the 12 steel companies are privately fearful that the current method of bargaining is too much of an attempt to do overnight what some people think should take some years.

Steel officials are perfectly aware that there has to be a new deal in steel labor concessions. Nevertheless they believe that to make the wrong move at this time might in the end defeat the very purpose of the long-term goal—a more stable and more reasonable labor cost with regained management prerogatives.

Another View—Most of this type of thinking comes from the older heads, some of whom went through the 1919 fracas as well as those who cut their teeth on the 1937 contracts and the Little Steel strike of the late 1930s. These people were forced to change their views quickly and react to new conditions brought on by pro-labor governmental fiat and the entire "New Deal." There are still some steel officials among these who believe privately that there is no stopping the present trend in labor advances except by economic factors not controllable by steel officials.

Turnabout—There is no sign this week that the present intention of steel firms to strengthen their collective bargaining position for the long term will be any different from what we have seen recently. The real surprise has come to the union. After years of having a chance to look over company offers and either refuse or agree to them it is a rough shock to find overnight that the entire deck has been changed. There will be no more patterns such as we have seen in the past.

What's Ahead—This is true even though some of the 12 steel companies are still dubious about their new type of bargaining. While the

current settlement - to - come may take the form of a "breather," it is clear that in the years ahead steel firms will drive toward the following:

—There will be no easy give-and-take when contract time comes up.

—The old easy way of relations between the steel union and steel negotiators may not return to vogue for some time.

—The industry will try every way possible to reduce its basic costs and try to get back some of the management rights it has lost.

—The steel side hopes to maintain a tighter control similar to auto industry management.

McDonald's Future—What about the union? How will it meet this new era? One thing seems certain: Dave McDonald will have to make a strong bid for the union presidency in 1961. That means he will have to go clear to the grass roots. At the same time, he will have to adjust to a new way of dealing with steel labor relations people. This may be hard for a fellow who has had things pretty much his own way for years.

Stormy Future?—But at the same time, it might not be too easy for the steel industry. The latter's well-laid plan of making over its labor relations may not come out nearly as pat at it now assumes. If that is the case, it could mean there will be labor troubles galore in the steel industry over the next several years. Only the closest cooperation and adjustment between labor and management can prevent this if the present new type of bargaining is to prevail.

Ike Wins Break for Steel Users

▪ Because of last week's White House "intervention" in the steel labor hassle, steelmakers will have a good chance to clean up most "carryovers"—shipments promised in one month but carried over to the next.

This means a whirlwind production of steel products in the first two weeks of July.

The Big "If"—If there is a steel strike at mid-July, steel users will have to revise their subsequent order pattern in line with the length of such a strike. If it occurs and is long, then steel orders will bulge later in the year. If there is no strike or only a token one, there will be a sharp falloff in the steel ingot rate in August and part of September. This will be due to heavy inventories, summer letdown, and vacation schedules.

The Union's "Offer"—The "offer" made by David J. McDonald, steel union chief, to the steel negotiators last week was so high in relation to their idea of a non-inflationary package that it was turned down abruptly and bluntly.

In terms of the union's figures, Dave's offer was about 15 or 16 cents an hour. The way the steel firms had it figured, it was about 20 or 22 cents an hour. The steel companies talk in terms of total wage costs, including incentives, pensions, etc.

Settlement Is Possible—It is still probable that some agreement will be reached in view of the "new" political angle, in view of the wearing down of the union side by the tough steel negotiating crew—and in view of the desire in some steel circles to avoid a strike if at all possible.

High Administration officials do not want a steel strike, even though they are reluctant to step into actual bargaining. But they have done and will do everything just short of sitting at the table to force a non-inflationary settlement.

Union Selling Short—One thing is certain this week: The union side is still selling the steel management team short in terms of management's determination to resist a settlement that would call for a price increase by any steel company. The industry's idea of a settlement is so far below what the union has come up with that more hard-headed bargaining is in store between now and midnight July 14.

Political Overtones—The steel labor negotiations are now far more intertwined with political overtones than they were two weeks ago—and there were plenty of vines in growth at that time; vines that lead right into the camps of both labor and management. It remained for McDonald, probably through Arthur J. Goldberg, the union's chief counsel, to get the White House bailing out team on the job. It delivered in the nick of time.

There has been no break in the solid 12-company steel front. But there are differences of opinion on how some things should be done and how far the new "brinksmanship" in bargaining should be carried. Thus the so-called minority thinking in the 12-company setup may become more vocal — and stronger—as July 14 approaches.

No Peace for McDonald—But this does not mean the sweat box will be any cooler for McDonald. It does mean that the entrance of the White House into the picture after most steel people were sure it would stay out has started a little sweating in the steel camp.

Best guess is still for a settlement which will be face-saving for labor and management and still allow the Administration to say that the public interest has been served.

Water Conservation Can Pay Off

More Plants Profit From Good Water Control Programs

Big water users are finding it advisable to study their water-using processes.

Savings are possible in process design, pumping, and treatment.—By H. R. Neal.

▪ There is plenty of fresh evidence to show that industrial water conservation programs pay off.

A glass plant reports it has slashed $102,000 annually from its water costs. In a vinyl plant, $52,000 was wrung from a yearly water bill. A bumper plating plant is soaking up $22,000 a year that it used to pay out for wasted water.

Some of these savings were realized through simple, common-sense practice such as shutting off water not in use. But a full measure of saving came about only after careful study of numerous operational factors.

Looking for Answers—To learn the answers to these problems of water economy, 150 executives from Midwestern companies listened in on a two-day seminar on "Industrial Water Conservation" at the University of Michigan.

An impressive example of how a water conservation program can pay off was offered by R. E. Miller, superintendent of utilities at Dow Chemical Co.'s Midland, Mich. works. This plant is the world's largest chemical complex on a single site. Its 600 buildings turn out 600 products and use hundreds of millions of gallons of water a day. The complex uses several types of water—lake, river, wells, demineralized.

Problem Areas—Dow faced no water shortage, says Mr. Miller. Rather, its conservation program was prompted by a shortage of pumping and waste treatment facilities—as well as excessive costs due to misuse of water.

As with nearly all industries, Dow consumes only a small part of the water it uses. Most of the water is used for cooling purposes and can be disposed of without further treatment. But a substantial amount must still be treated before it is discharged from the plant to protect the next user. Treatment facilities are expensive.

First Action—To start out with, Dow had to find out what its water costs were. In determining the cost, five elements were considered, says Mr. Miller. These included costs of water source, pumping, distribution, collection (sewers), and disposal.

The costs were determined by installing meters for each type of water used in all the using plants. At the end of the month each user is billed, just as residential users are, for the amount of water passing through the plant.

Huge Net Saving—Then the five cost elements were compared with the cost of a conservation program —cooling towers, recirculation, and other equipment. The conservation program proved to be the least expensive.

The result: A net saving for Dow of $250,000 for direct pumping and

How to Cut Plant Water Costs

Dow Chemical Co.'s water conservation program emphasizes these steps:

Shut off water when not in use.

Recirculate water where practicable.

Cascade cooling water from one cooling operation to another when successively higher temperatures can be tolerated.

Substitute where cheaper water can be tolerated.

Justify and review all requests for additional consumption.

Record exit temperatures of large users.

Control exit temperature of cooling water.

Industrial water conservation experts emphasize the importance of controlling the exit temperature. If the temperature of the cooling water rises only 1° to 2° before exiting, you aren't getting your dollar value. It should have about a 5° F increase. Some operations will withstand a 10° F rise.

distribution costs alone, an increase in pressure without increasing the equipment outlay, and greatly improved waste disposal plant operation.

Ford Experience—F. J. Kallin, manager of Ford Motor Co.'s engineering services department, pointed out that control of water requirements depends on two factors, (1) Initial design of water conservation facilities and (2), their installation.

He cited one instance where a Ford plant required double the amount of water originally estimated for operation, placing excessive demands on the municipal source. At the same time, the sewage treatment was overloaded. Cooling water from a number of machines was being discharged into the nearest sewer instead of being connected to the cooling tower for re-use.

Money-Saving Switch—As soon as the discharged cooling water was connected to the proper line, water use fell within original estimates. And the load on the sewage treatment facilities fell by two-thirds.

Design and selection of the proper process can sometimes help reduce use of water. Mr. Kallin said study of two comparable bumper plating operations showed one required 122 gal. of water per bumper, the other 210 gal. This was due to design differences in the cleaning and rinsing stages.

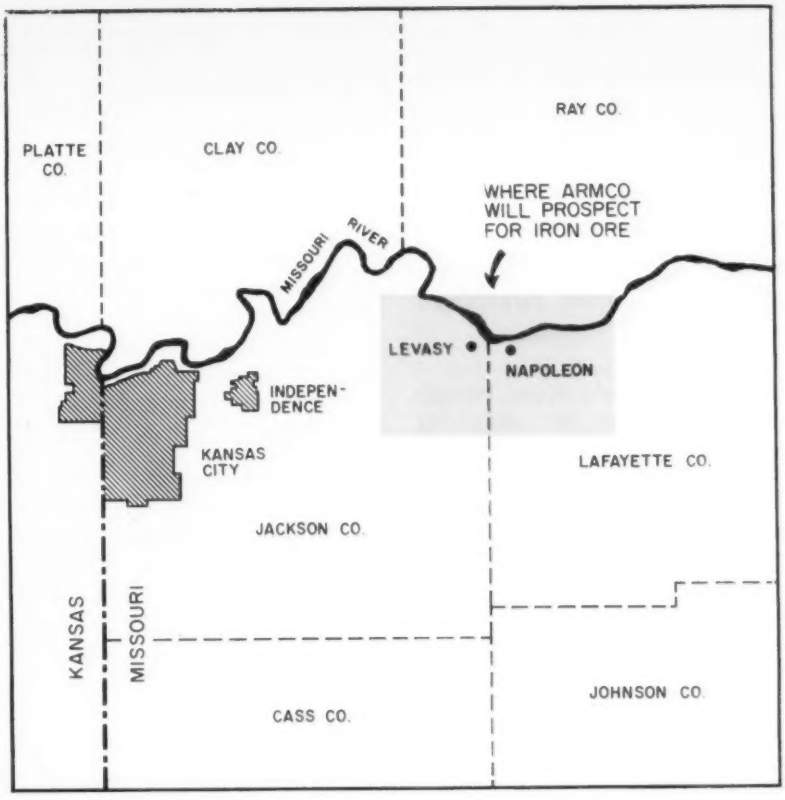
K. S. Watson, water management consultant to General Electric Co., urged that water management programs should encourage each plant to:

1. Make sure it is using the best source available from the standpoints of quantity, quality, and cost. A sound water program should be a factor in selection of plant sites.

2. Find an adequate supply of special waters—softened, deionized, etc.

3. Practice conservation of water and recirculation where economical.

4. Know water costs, even when it is from a plant-developed source.



IRON ORE HUNT: Armco explores for ore near its Sheffield mill.

New Missouri Mill?

■ The expanding metals industry in Missouri may one day have its first integrated steel mill—possibly using direct reduction of iron ore.

Armco Steel Co.'s Sheffield Div. has optioned several thousand acres of land near its Kansas City, Mo. mill and is core drilling for underground iron ore. The mill does not now produce its own iron and thus is not an integrated operation.

Future Decision—"If we should find it commercially feasible to get the ore out," a spokesman says, "company officials would then decide on the next step.

"A direct reduction operation would probably be more feasible than a blast furnace. At present we are just doing the exploration. No underground ore has been discovered so far and we are only down through the flinty chert."

Drill Site—The drilling is being done near the towns of Napoleon and Levasy on the Missouri river about 15 miles due east of the mill.

At the other end of the state, work is progressing on the $35 million Pea Ridge project of Meramec Mining Co., a subsidiary of Bethlehem Steel Co. and St. Joseph Lead Co., its discoverers. (See the IRON AGE, Nov. 20, 1958, p. 59).

Firm Faith—The Missouri Div. of Resources and Development believes a major underground ore body extends diagonally across the state, and it is pushing for full exploitation. Only other major iron mining in the area is at Iron Mountain by Ozark Mining Co., a subsidiary of M. A. Hanna Co., Cleveland.

Mobile Homes Use More Metal

The old house-trailer has grown up into the bigger, more swanky mobile home.

It's a small bonanza for metalworking — frames, furnishings, trim.—By F. J. Starin.

▪ When a tornado ripped through Colfax, Wis., last year destroying 250 homes and damaging 426, the Wisconsin Mobile Homes Assn., rushed in some mobile homes until the community could be rebuilt.

Chicago Helicopter Airways uses a mobile home as a terminal at Winnetka, Ill. A New York stockbroker moves his office to Florida each winter in a mobile home complete with short wave radio, ticker.

Mobile Home Dwellers—These are exceptions. Most mobile homes are lived in—about 3,480,000 people in 1,200,000 units. But they do point up the overwhelming acceptance the mobile home has gotten in the last few years.

It's developing into a fat market for metalworking.

In 1958, members of the Mobile Homes Mfg. Assn. built 133,750 units, of which 30,762 were small travel trailers, not considered in this study.

Big Steel Customer — Elkhart Welding & Boiler Works, Inc., Elkhart, Ind., a leading maker of frames for mobile homes, estimates about 80,000 tons of steel will be used for frames in 1959—mostly hot rolled, with some Junior I-beams.

The same company figures mobile homes will use about 23,000 tons of galvanized for roofs.

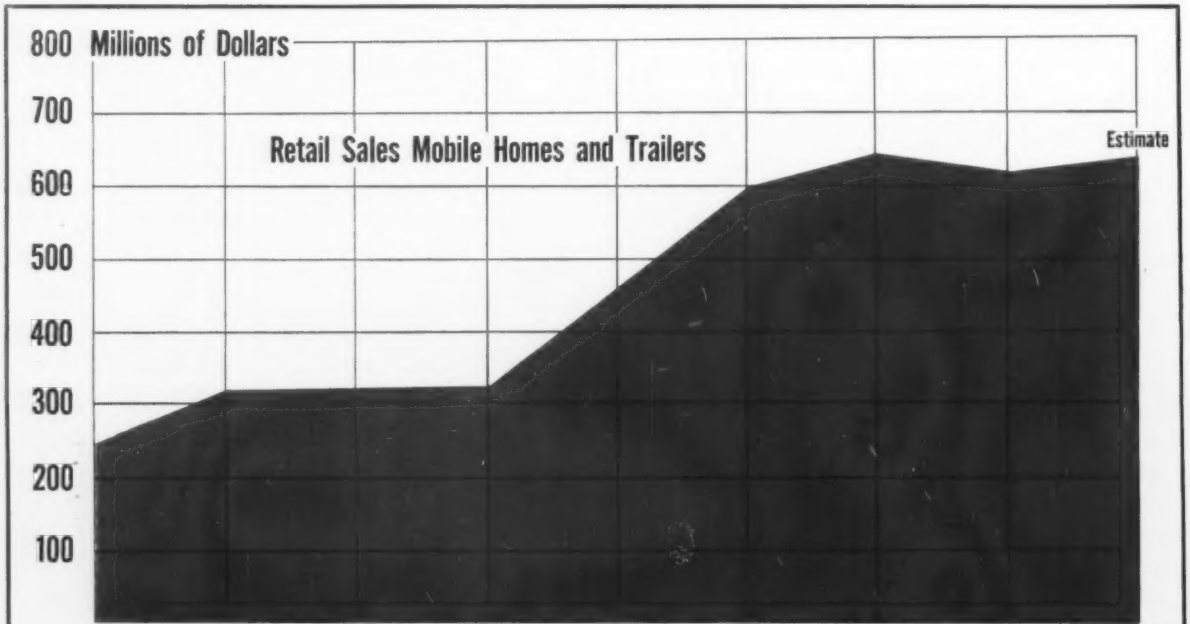
Because carbon steel has sharp competition from aluminum and stainless steel for sidewalls and ends it is difficult to estimate its share of the market at any given time.

Weirton Steel Co., a major supplier of carbon steel for sides has sold 5810 tons to mobile home makers through April this year, compared to 9679 tons all of last year, and 3679 tons in 1957.

More Aluminum—Aluminum figures to easily top the 19,125 tons Kaiser Aluminum says were used for sides in 1958. Estimates run 22,000 to 23,000 tons. The 3375 tons of aluminum extrusions and castings for interior trim is also likely to be topped this year.

How fast will this market grow? Aluminium Ltd. figures the population of mobile homes should hit about 21 million by 1970. This would be a whopping 700 pct increase in little more than a decade.

More People Buy More Mobile Homes



The Mechanized Coffee Break

▪ The vending machine business —one of the boom babies of the past decade—has room for further growth in providing in-plant food service to industry.

Although 9 out of 10 plants with 250 or more employees have vending machines now, at least 21 pct of these plan to increase the number or change the type of machines now in service. This estimate is provided by a U. S. Agriculture Dept. survey.

A Mixed Blessing—Plans for increases in vending machine coverage are scattered over a variety of items. Leading the list are coffee, milk, and soft drinks. Other items range from soup to fresh fruit and pastry.

"Apparently not an unmixed blessing, vending machines were praised by the great majority of plant executives, but were criticized by almost as many," the Agriculture Dept.'s Marketing Research Div. reports.

Some of the praises:

Vending machines are a morale builder, they save production time by keeping employees near the job, they supplement other food services, they cost less than other food services, they produce revenue.

Some of the complaints:

Vending machines create housekeeping problems, too much time is lost at machines, machine servicing is unreliable, vandalism and pilferage is a nuisance, machines take too much space.

With the prospect of a 21 pct increase in new installations, it appears the advantages greatly outweigh the disadvantages.

Why Workers Are 'Eating In'

An extensive survey by the Agriculture Dept. uncovers industry's eating habits.

The trend is toward more cafeterias and more mobile food carts.

▪ Are in-plant cafeterias and restaurants worth the trouble they take to operate?

A majority of executives representing 6000 manufacturing plants surveyed by the Dept. of Agriculture gave food services a vote of confidence. More than 9 out of 10 said that, given the chance to reconsider the decision, they would again set up employee food facilities.

Morale Booster—Top reason for this management sentiment was that in-plant food service is a morale booster. Food services provide more healthful and less expensive meals than employees would otherwise get. And they offer employees an opportunity for getting together socially.

In some cases, in-plant facilities were provided because of inadequate public eating places in the vicinity.

Helps Productivity — High on the list of reasons stated for maintaining food service is the resulting gain in production.

Fifty-six pct of the executives said food services permitted a shorter lunch period and so saved production time. Nineteen pct spoke simply of "improved production." Six pct indicated that the facilities helped to cut down time lost through illness. On the other hand, 16 pct claimed that in-plant food services disrupted production.

Some executives felt that food service improved labor-management relations. Some also believed that it is helpful in recruiting personnel.

The Disadvantages — The chief drawback in providing food service was cost, the Agriculture Dept. notes. Few food services were on a truly profit basis.

"About 6 in 10 plants with company-run facilities indicated that a direct financial contribution was made, compared with about 2 in 10 where the facilities were contract-operated," USDA points out. And indirect subsidies in the form of free rent, utilities, and other overhead expenses seemed to be practice in contract as well as company-operated services.

Other important drawbacks of in-plant food services included the drain on management time, the difficulty of pleasing all employees, and lack of space.

Outsiders Preferred—"Generally speaking, plant executives appeared to look more favorably upon direct contract than upon company operation of food service," the survey reports. "Not only had two out of three companies chosen to have their food service run by a contractor, but those currently using contractors appeared to be better satisfied than executives whose facilities were company-run."

They'll Try Rubber for Roads

HIGHWAY SPECIAL: Special 650 lb sections of rubber will be put between the concrete slabs (and anchored with steel trusswork) on a stretch of the Baltimore-Harrisburg Expressway now under construction at Hereford, Md. The 13-in. wide sections can absorb up to three in. of pull or push while staying flush with the surface. Highway engineers say it will eliminate much of the road shock.

Steel Wins Battle At Ogden Dunes

Work will begin within weeks on National Steel's new $10 million steel finishing mill in the Indiana Dunes area. National Steel began work on a 80 x 400 ft one-story office building last week as construction headquarters for the mill construction work to be begun later.

The office building was begun with little fanfare. Porter County passed an ordinance zoning the area, in which Bethlehem Steel, National Steel, and Inland Steel own property; for heavy industry. At the same time, Portage township has incorporated as a town, and is expected to zone the area for heavy industry.

About Over—But it is still possible for little Ogden Dunes, which has been fighting against steel development in the area, to file an injunction to stop development of the property. This is not regarded as very probable. The injunction would require posting of probably a large cash bond.

The beginning of construction marks the end of a legal battle that stretched for months, and came within an ace of going into Federal Court, which might have prolonged the struggle further (Iron Age, May 21, P. 108).

The National Steel plant should eventually produce tinplate, galvanized sheet, hot and cold rolled sheet. The mill is planned strictly as a "finishing mill" with hot rolled coils. supplied by Great Lakes Steel. No hot metal capacity would be involved at the Indiana dunes site.

Census of Engineers

The 1960 U. S. census will give the government and industry a better line on the location of engineers.

Persons in ten separate branches of engineering will be counted in the decennial census which begins next spring.

The U. S. Census Bureau tells Congress the facts gathered cannot be expected to supply all the information needed for a detailed listing of scientists and engineers. This problem of insufficient material on persons whose skills are in high demand is one which has troubled the government for years.

Statistics on age, income, education, and other pertinent subjects will be sought from U. S. residents in a door-to-door count. This check will be taken by 160,000 census-takers.

Ford Army Trucks

Ford Motor Co. is to make the first deliveries of new quarter-ton trucks to the Army next spring, under terms of a $15,070,000 contract.

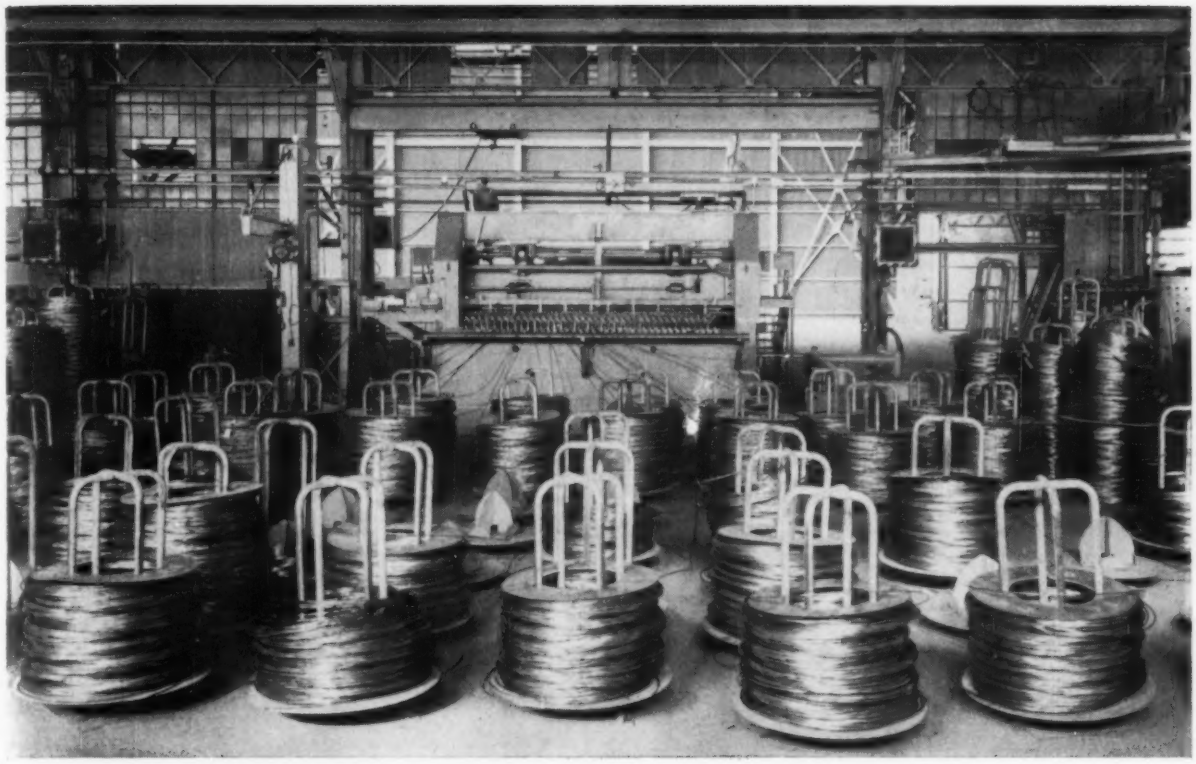
The Army is to buy 4,050 of the trucks. These M-151 utility vehicles, light in weight, can be air-dropped, the Army says.

Ford is to assemble the vehicles at its Livonia plant, near Detroit. Some 1300 new jobs will be created in plants of the prime contractor and subcontractors in Mich. as a result of the Army order.

Convert Atomic Plant

The Defense Dept. will convert a former atomic energy plant at Newport, Ind., for production of undisclosed materials. Total cost of the new plant is estimated at about $13.5 million, according to Sen. Homer E. Capehart (R., Ind).

Food Machinery & Chemical Corp. has been selected to carry out a design and construction contract.



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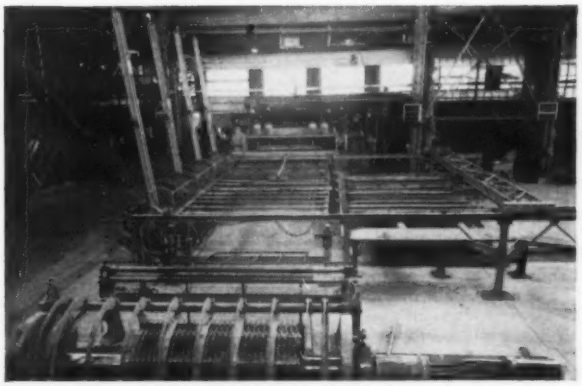

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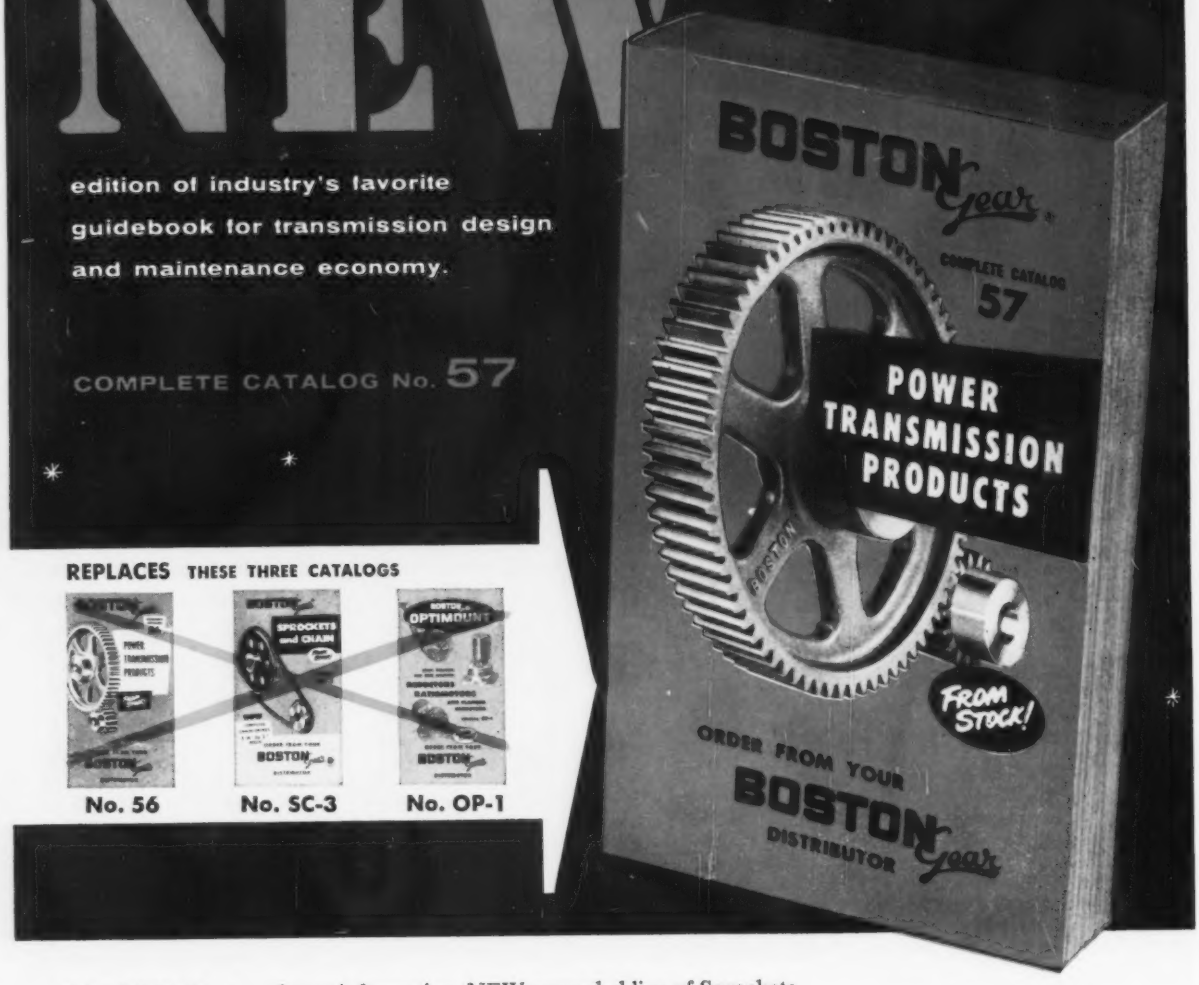

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Karl W. Hallden

An Inventor's Place in Industry

In the machine tool industry, business starts with the inventor, says Mr. Hallden.

His own creative ability has been a prime factor in his company's growth.

▪ A lot of metal has been cut with Hallden machines since Karl William Hallden designed his first flying shear back in 1916.

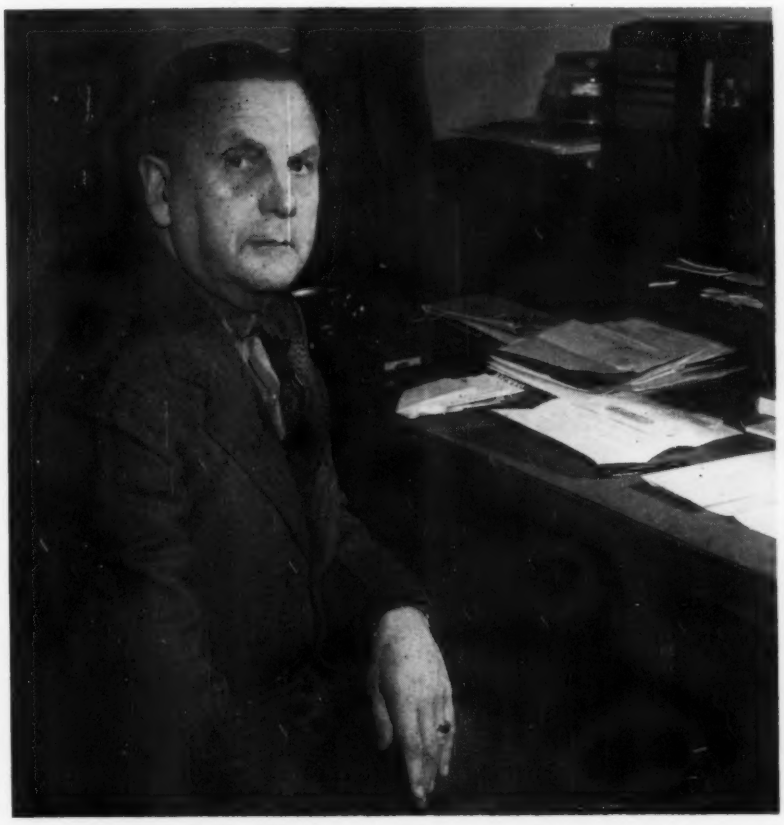
Forty-three years and 50 patents later, the company of which he is president—Hallden Machine Co., Thomaston, Conn. — is a major producer of automatic shearing, straightening, and flattening equipment.

Premium on Inventiveness — To the world of metals, flying shears are an important link in the development of high speed, accurate methods for producing parts from sheet and strip.

In developing his machines and his company, Mr. Hallden places a premium on inventiveness. He considers the inventor the pacemaker in the machine tool industry. During the working day, he spends most of his time with his engineering staff. Wherever possible, he leaves financial and marketing problems to the accountants and salesmen.

How It Began—A native of Sweden, Mr. Hallden came to America with his parents at the age of 9. The family settled in Bakersfield, Conn. By the time he was 17, Karl landed a machinist's apprenticeship at Hendey Machine Co., Torrington, Conn. Luckily, he hit his calling on the first shot.

He began studying mechanical engineering on the side and in three years got his papers. But his quest for knowledge wasn't over. While working at a drafting table, he began special study at Trinity College. After getting a taste of liberal arts education, he enrolled full time and was graduated in 1909. It was the start of a lifelong association with Trinity.



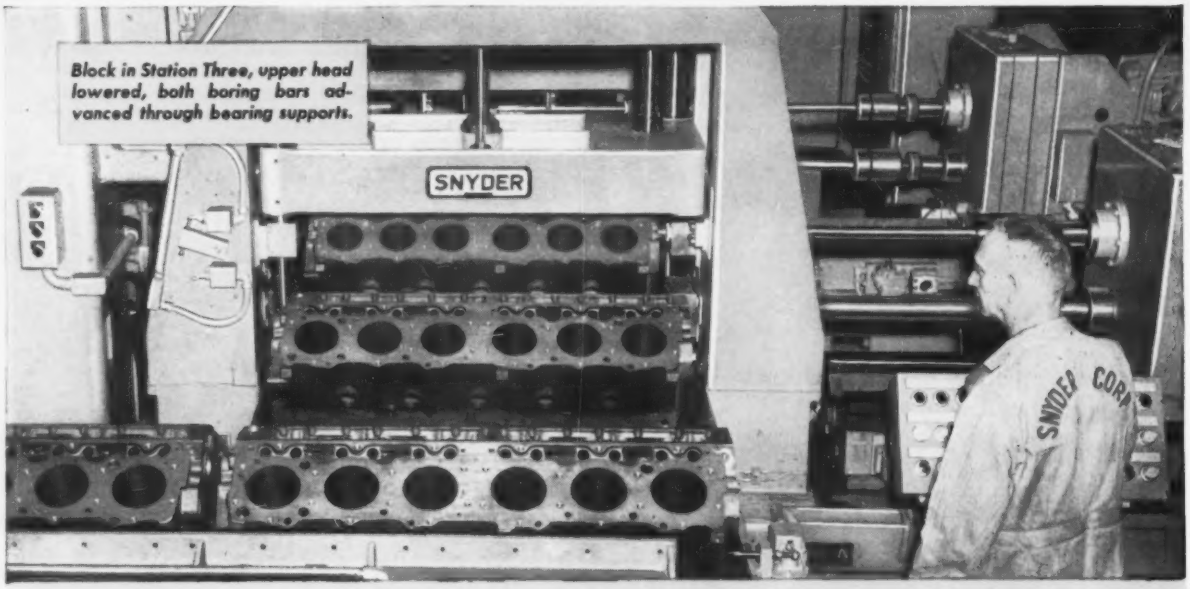
KARL W. HALLDEN: Setting the pace in flying shear design.

Outstanding Alumnus—Mr. Hallden has since underwritten construction of Trinity's engineering laboratory, endowed the Hallden Professorship of Engineering, provided funds for scholarships, and made many more contributions of time and money to his alma mater.

In turn, he has been named Life Trustee and has received an honorary doctorate from Trinity. The college also has placed its facilities at the disposal of Hallden Machine Co. for solving problems in machine design.

Advice to Introverts—Outside the plant and his duties at Trinity, Mr. Hallden is active in community affairs. He has a one-man campaign underway urging engineers "who tend to be introverts," to join community organizations.

He sets the example. He has long been embroiled in local politics, even though he has not run for office. He is sponsor of many civic enterprises, including the Hallden Little League team in the Thomaston circuit.



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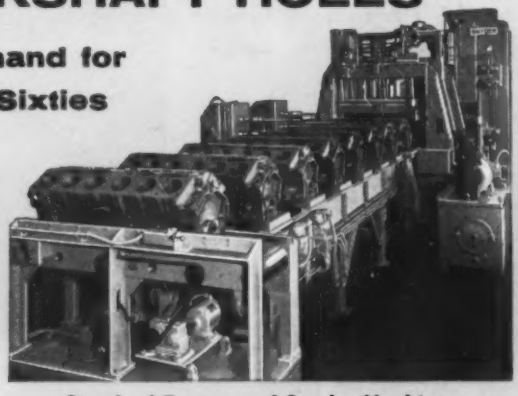

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How Stable Prices Aid Recovery

A big factor in the new business boom is the fact that increases in income are not eaten up by increases in prices.

Factory workers are now taking home 9 pct more than a year ago. And it means an equal increase in purchasing power.

▪ In publishing government statistics, disposable income is charted in current and in constant (1958) prices. This, of course, is to show the effect of price changes on purchasing power.

Since early last year, the two curves have overlapped, indicating the stability in prices. What this means is that the worker who is now bringing home 9 pct more today than a year ago is also bringing home 9 pct more in purchasing power.

Results Show — And apparently he's using it. The greater earnings, undiminished by higher prices, are probably the greatest single factor behind the high level of business. Consumer durables are still carrying the brunt of the production recovery. They are obviously riding on the higher pay.

In May, spendable earnings of factory workers, and the purchasing power of these earnings, reached all-time highs, according to Bureau of Labor Statistics.

The Figures—Compared with a year ago, spendable earnings were up 9 pct. This is the result of a longer workweek, more overtime and premium pay, and slightly higher wage rates.

You can figure that workers in your metalworking plant are better off than the average. Nevertheless, average earnings are getting right up there.

Nationally, gross average weekly earnings are $90.32 for factory workers. This gives a worker with three dependents spendable earnings of $81.03, compared with $74.68 a year ago.

What's Ahead—How long this favorable situation of higher earnings and stable prices will last is open to question. Higher interest rates and tighter money, while designed to stem inflation, have an immediate inflationary effect, even though it may not show up on list prices of consumer products.

While basic materials and most major manufactured products have held the line, prices of many items and services have been going up all around: Medical costs, clothes, shoes, transportation and many others. Higher state and local taxes this year will take a big bite out of everyone's income.

Many financial experts believe that a new round of inflation is in the making now and will start to show up within 90 days. It's doubtful if it will have an immediate effect on the business pace, but it's something to watch closely.

Seaway Trend Not Yet Apparent

▪ If the St. Lawrence Seaway is going to flood the Midwest with low-cost imports, it isn't showing up in the first weeks since the opening.

Of course, early tonnage reports are not indicative of a trend. Furthermore, delays because of a late spring kept Great Lakes-bound tonnage below expected levels.

Year-Ago Comparisons — However, May upbound tonnage through the Welland Canal was only 28.9 pct over May of 1958. Of the total of 681,250 tons headed from Lake Ontario to the upper Lakes, only 45,150 tons was general cargo. The rest was bulk.

Downbound, the tonnage was much greater. The bulk cargo totaled 2,255,300 tons, general cargo, 160,100 tons. This was still only a 9.2 pct increase.

It should be understood that general cargo includes the manufactured products. Bulk cargo includes coal, ore, grain, limestone or other products that can be loaded in bulk.

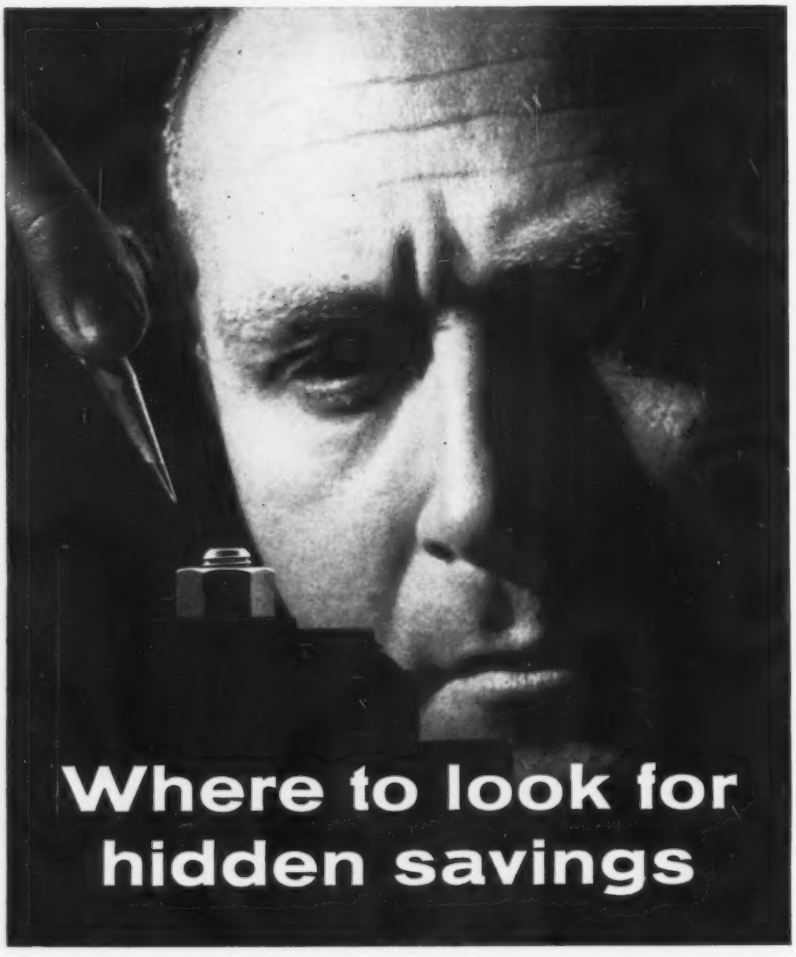
No Trend—If there is a real trend on imports to the Midwest through the St. Lawrence, it has not yet developed. There has been a substantial tonnage of imported steel reaching Cleveland and Chicago, but nothing to affect the market as yet.

Freight Car Plans

New freight car orders, which are up to a modest 5253 in May, don't tell the entire story. The railroads are, or soon will be, placing more substantial orders.

The daily average surplus of cars is falling off sharply and the reported shortages are mounting rapidly. Furthermore, the profitable position of the roads means buying of more cars is in the wind. Financing can be arranged and the need for more cars is not questioned.

ECONOMIC FACTS ON FASTENERS



Where to look for hidden savings

- **Fastener value-analysis shows big dollar savings**
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If you know what to look for, there are sizable savings to be found in standard fasteners. See what happened when the *RB&W Fastener Man* analyzed fastener usage:

Shown the merits of high strength bolts, a company standardized on them exclusively, saved $12,000 the first year, $28,000 the next.

Showing a manufacturer how to substitute high strength bolts for heavy head milled bolts, the RB&W Fastener Man pointed to a $4,500 annual saving on this item alone.

At a plant with 23,000 different fastener items in inventory, more than half were eliminated...cutting costs from buying to assembly.

Where special fasteners were used in heavy equipment, substituting cap screws offered $13,000 saving on a production run of 500 units.

So it goes. Using high carbon cap screws where costlier socket screws are not really needed . . . cap screws for studs and nuts in certain applications . . . replacing machined parts with cold headed pieces . . . there are plenty of ways to economize.

Take a look at your own fastener usage through the eyes of an RB&W Fastener Man. Contact Russell, Burdsall & Ward Bolt and Nut Co.

R B & W
115th year

Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**

Superior joints in heavy duty products

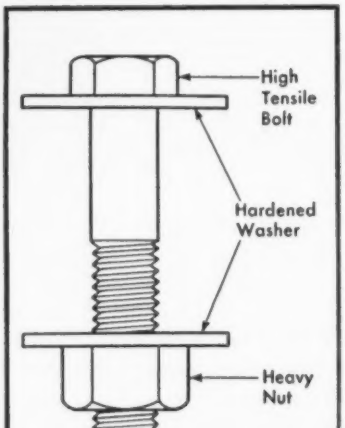
...achieved with RB&W High Strength Bolts

Plenty of experience now proves you can stop fastener failures with high strength bolts. Especially in products subjected to much vibration in service. Properly tightened, these bolts make the joints not only *permanently* tight, but *stronger.*

Here's why: A joint is only as strong as the *residual tension* left in fasteners after tightening. The more you tighten, the better it is.

RB&W High Strength Bolts allow a high level of tightening. Friction between bolted surfaces increases with the tightening, so that slippage of the joined members against each other can't take place. This makes the joint better able to resist external forces which try to shear or separate the joint.

In addition, with high residual tension, these fasteners are also more immune to the fatiguing and loosening effects of loads which constantly vary, such as vibration.



RB&W High Strength Bolts conform to ASTM A325. They're made of a selected grade of high carbon steel for proper balance of hardness and ductility. Use of hardened washers distributes their high clamping force over larger area.

As a result, one manufacturer of heavy duty shaker equipment has found them the only answer in troublesome joints which formerly required constant maintenance. Others are ending rivet failure and costly replacement in cranes, ore unloaders and freight cars with RB&W High Strength Bolts.

If you're making similar or related heavy duty equipment, talk it over with an RB&W Fastener Man.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY

The Coming Battle of Small Cars

U.S., Foreign Producers Flex Muscles for Fall Campaign

Detroit is confident the new American small cars will win out over foreign makes.

But there is strong evidence that foreign cars are here to stay.—By H. R. Neal.

■ Now that all U. S. automakers have jumped into the light-car field with both feet, what's to become of the small foreign economy cars?

If you talk to Detroit automakers in the beer halls around the City of Wheels, you get the impression they'll squash the beetle-size cars when the U. S. jobs land in the market place.

Taking It Smoothly—If you happen to be sipping a highball in a hotel suite and share a bowl of peanuts with a suave representative from one of the automakers in Germany, France, or Great Britain, you receive an entirely different impression.

Unmistakably, beer and bourbon don't mix. But there's little doubt, now, that the two—be they beer and bourbon or compact and economy cars—can exist in the same market place.

90-Proof Argument — The men around the peanut bowl who sell the peanut-size cars have some pretty convincing arguments why they aren't going to be gobbled up like the goobers—at least not all of them.

Sales of imported cars hit a new record of 53,359 units in April, according to latest registration figures reported by Automotive News, industry weekly trade paper. Sales for the first four months of 1959 total 180,546 units. The foreign "threat" was making itself apparent last year when registrations in the same period totaled 96,241.

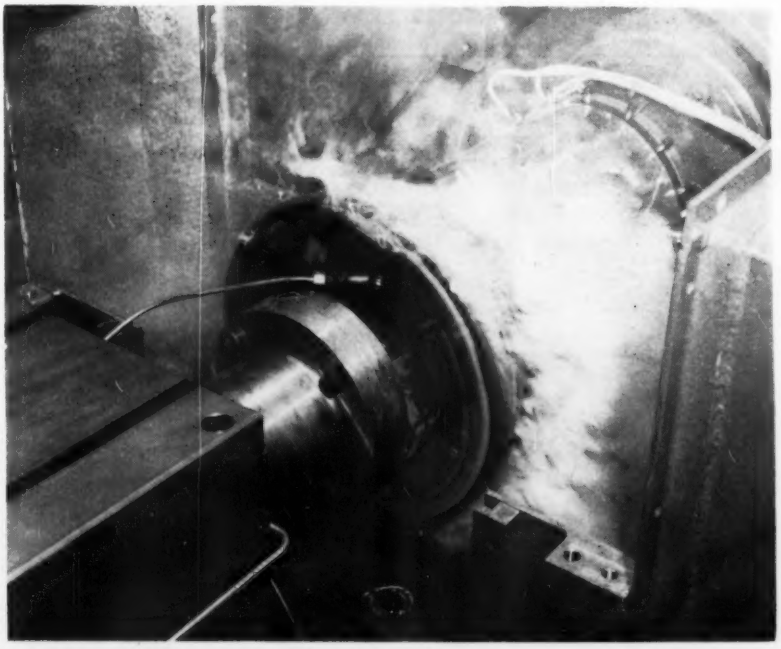
Some Will Pass Out — Significantly, the "top ten" makes in foreign car registration account for 136,504 of the registrations. Nearly 60 other makes split up the remaining 44,042 units, and herein lies the tale of how the beer and bourbon will manage to exist together.

The next few years will see a shakeout of foreign automakers who are making a "serious" try for the American market. A number of makes, particularly sports cars and luxury types, will content themselves with the fact they will always have limited market appeal. But a score of strange names which comprise the miscellaneous sales figures will find the going rough.

The Chugaluggers—Volkswagen and Renault, 1-2 among the imports, appear firmly entrenched in the U. S. Market. And the remaining makes in the top ten have taken advantage of the small-car boom in the past two years to strengthen their position.

Each of the U. S. automakers has contributed to the foreign car-mix-

Aftermath of a Sudden Stop



HERE'S WHAT HAPPENS: A brake lining smokes ominously at Ford's engineering and research laboratory, after being subjected to a series of "panic stops" from speeds of more than 90 mph. Getting rid of heat generated by braking is a major problem to engineers.

up with at least one make of its own being offered — either through a marketing agreement or a foreign subsidiary. And four of the makes in the top ten are these "captives."

Holding Up Well—Third place belongs to the English Ford lines; fourth is held by the French Simca which is marketed through Chrysler Corp. dealers; Buick dealers have lifted GM's German-built Opel to fifth position, from ninth a year ago; and GM's English-built Vauxhall has gone from tenth place to eighth as Pontiac salesmen get the swing of selling smaller cars.

Others in the top ten are: Fiat, 6th; Hillman, 7th; Triumph, 9th; and Volvo, 10th.

Back in the Beer Halls—It isn't likely that U. S. automakers are going to abandon their successful small cars. In fact, the evidence is to the contrary. Chrysler has already told its Dodge dealers they won't get the Valiant, the firm's new light car—but they will sell Simca.

And Simca has just added a few new models to its already broad line of small cars—the Elysee, four-door, five-passenger sedan with a suggested port - of - entry price of $1898, and the Grand Large two-door, five-passenger hardtop with a suggested price tag of $2071 p.o.e.

Stamina Will Tell—"Perhaps the only answer worth offering at this time is that the situation, for the more worthy imports, is apt to work itself out in terms of dealer stamina than in terms of what the cars themselves have to offer." The appraisal was made before automen attending a recent SAE meeting by Laurence E. Crooks, chief of the automotive division of Consumers Union of U. S., an independent consumers research company.

Pontiac Introduces Throttle Control

Pontiac is now offering a new throttle control accessory which, when set, maintains a constant accelerator position after the driver removes his foot from the pedal. A light tap on the brake pedal disengages the control.

Called Magi-Cruise, the control device is specifically intended for turnpike driving. No price was announced, but the accessory was described as "low in cost."

If the device follows the pattern of other accessories and optional equipment offered by Pontiac it should do well. Popular items on this year's models according to the percentage of vehicles on which they are installed:

Super Hydra-Matic transmission, 98 pct; Circ-L-Aire heater and defroster, 98 pct; back-up lamps, 92 pct; radio, 91 pct; white wall tires, 81 pct; power steering, 72 pct; and power brakes, 67 pct.

Automotive Production

WEEK ENDING	CARS	TRUCKS
June 27, 1959	130,621	27,670
June 20, 1959	130,927	27,439
June 28, 1958	92,277	16,736
June 21, 1958	84,396	17,110
TO DATE 1959	3,239,735	646,817
TO DATE 1958	2,233,442	444,071

*Preliminary Source: Ward's Reports

The Bull of the Woods

SEE IF YOU CAN FIND A CROWBAR, AN' GET A KEY DRIFT-- WE'VE GOT TO PRY THIS GEAR A--- SAY, PUSH MY CAP BACK AN' ROLL THAT SLEEVE UP AN' TUCK MY NECK-TIE OUT OF TH' WAY!
NO WONDER A BOSS, AFTER HE'S SHOWED YOU HOW TO DO A JOB, CAN THROW OUT HIS CHEST AN' SAY, "SEE HOW EASY THAT WAS!"
WHEN A BOSS WANTS A REST, HE JUST STEPS IN AN' SHOWS YOU HOW TO DO A JOB AN' THEN ASKS YOU TO SCRATCH HIS BACK-- IT'S A RACKET!
I THINK HIS SHOE IS UN-TIED AN' HE WANTS TO GET IT LACED UP!
WHY-UH--I BETTER GET A PIECE O' WASTE AN' WIPE MY HANDS FIRST!
© 1959 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.
VALET SERVICE

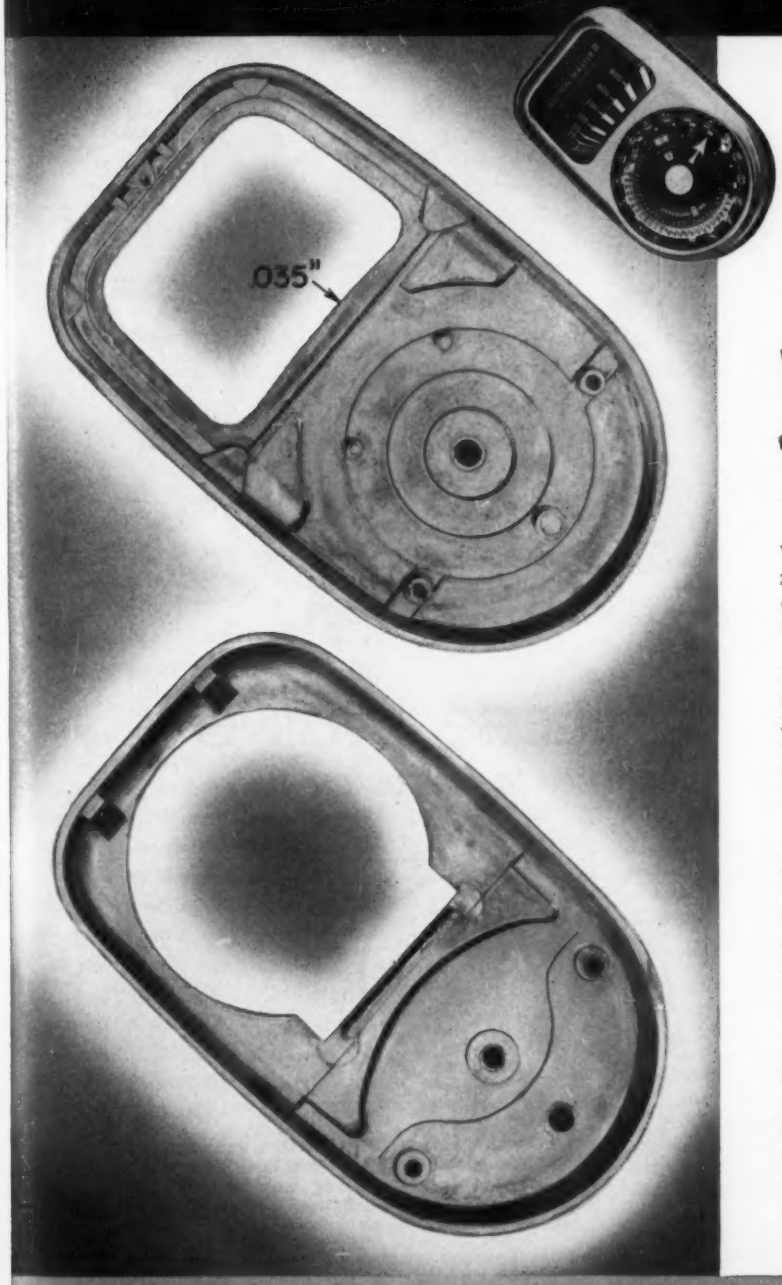
Exhaust Control

Thompson Ramo Wooldridge, Inc., and Chrysler Corp., are joining in a cooperative project to bring automotive exhaust after-burner devices to the production stage. The devices are intended to reduce unburned hydrocarbons and carbon monoxide in exhaust elements suspected of contributing to smog.

Thompson will work primarily on systems engineering, miniaturization of the device, including "packaging" design, and the building of prototype units.

Chrysler will concentrate on development of materials, controls and application engineering, and will conduct the extensive field testing. Both companies will carry on supporting research directed at reducing the cost of afterburner units and improving their durability.

IT'S LIGHTER THAN YOU THINK!



EXCEPTIONALLY ACCURATE... STRONG... ECONOMICAL... WHEN DIE CAST with ZAMAK

WESTON has been using these wafer-thin zinc die castings for the front and back covers of this world-famous exposure meter for 14 years.

Converting from an all-plastic case in 1945, Weston selected zinc die casting alloys for this popular precision instrument because ZAMAK offered the most in all-'round advantages. High strength combined with the lightness of a thin-wall zinc die casting were primary considerations.

Extreme accuracy of dimensions, as-cast, and the convenience of casting contours on the inside of the case for mounting to the instrument were additionally important values. Ease of assembly of the tamper-proof construction and a lasting, satin-chrome finish were extra dividends – all of these and economy, too, when die cast with ZAMAK alloys.

As in many other applications, such extremely thin wall sections – possible only with zinc die castings – minimize weight and are stronger **in proportion to thickness** than heavier sections. Such parts designed for ZAMAK alloy die casting will more than meet competition of either stampings or aluminum castings – provide many more advantages and all at lower cost.

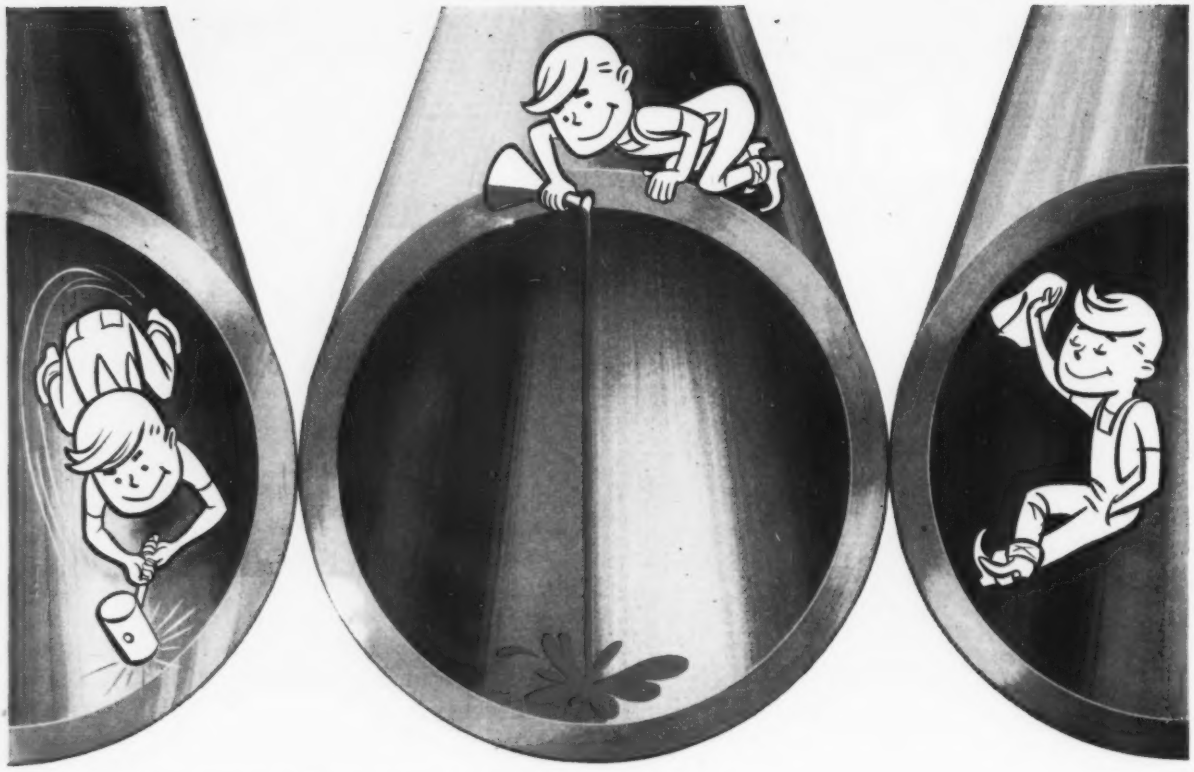
HORSE HEAD® SPECIAL ZINC AND HORSE HEAD ZAMAK ARE PRODUCED BY

THE NEW JERSEY ZINC COMPANY

DEVELOPERS OF THE ONLY STANDARD ZINC DIE CASTING ALLOYS IN USE TODAY

160 Front Street · New York 38, N. Y.

HORSE HEAD PRODUCTS ®



The smoother surface of

CONTOUR-WELDED* STAINLESS TUBING

gives it greater resistance to corrosion

Recent tests prove: (1) Contour-welded tubing is smoother than any other tubing, and (2) this extra smoothness provides greater resistance to corrosion.

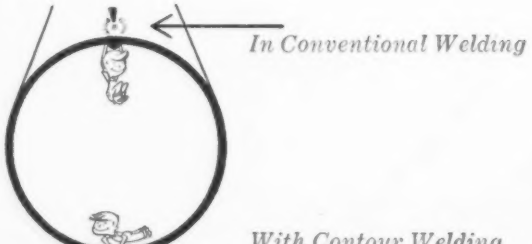
Here's how TRENTWELD® tubing, made by the exclusive *Contour-Weld* process, compares with other full-finished tubing:

- It's smoother than seamless because it's formed from uniformly rolled strip steel, whereas seamless is extruded from a billet.
- It's smoother than other welded tubing because the *Contour-Weld* process, patented by Trent, virtually eliminates the weld bead.

Other tests prove this smoother surface provides *increased resistance to corrosion* — because there are fewer focal points for corrosive attack. Not only that, the smoother surface ensures *longer fatigue life* and *less product incrustation.*

But get full details. Our free 48-page *"Trentweld* Manual" gives complete data on *Contour-Welded* tubing in sizes from ⅛" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy and Hastelloy.† Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.

†Trademark Haynes Stellite Co.



In **CONVENTIONAL WELDING** of tubes, gravity pulls the molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

***With CONTOUR-WELDING** the tube is welded at the bottom. Gravity still pulls the molten metal down inside the tube, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.

CONTOUR TRENTWELD

stainless and high alloy pipe and tubing

TRENT TUBE COMPANY

Subsidiary of Crucible Steel Company of America • GENERAL OFFICES: East Troy, Wisc. • MILLS: East Troy, Wisc.; Fullerton, Calif.

Labor Wants to Be "Reformed"

AFL-CIO Believes Mild Law Would Close the Issue

Union leaders fear if they don't take the slap on the wrist now, they'll get slugged in 1960, an election year.

They're urging union members to write their Congressmen. —By G. H. Baker.

▪ Labor reform is being urged anew by AFL-CIO leaders.

Independents like United Mine Workers President John L. Lewis, and Teamsters President James Hoffa, want no reform law at all. But the AFL-CIO hierarchy believes it is politically smart to get a "mild reform" law on the books now.

Next year is an election year, and reform tempers traditionally are high when vote counting time is nigh. AFL-CIO calculates shrewdly that a slap on the wrist in 1959 will be far better than a tough reform law forged in the political heat of an election year.

"Labor wants an anti-racketeering law," the AFL-CIO hierarchy declares in a new full-page announcement in the AFL-CIO News. Here's what the union leaders want. Note the similarity to this plan and the Kennedy "reform" bill before it was toughened up:

Public financial reports by unions and employers, policed by U. S. Labor Dept.

Safeguarding of union election processes.

Ban on improper trusteeships for unethical purposes.

Voluntary "ethical practice" codes and a government study of labor-management relations.

Rewrite of Taft-Hartley law to make foremen and supervisors subject to unions, plus other Taft-Hartley changes.

"Write Your Congressman"—AFL-CIO officials are urging rank-and-file members to hit Congress with a flood of mail demanding these reforms. "Write your congressman today," the union heads urge. "Tell him you want to get at the crooks. Tell him you won't stand for a law that hurts your union. Tell him you want honest labor-management reform — not labor ruin."

An avalanche of mail from the grass roots could go a long way toward achieving the AFL-CIO hopes. But labor reform otherwise is hung up this year—caught between union demands for soft reform and the desire of many congressmen for a meaningful clean-up.

Defense for Michigan

Michigan is fighting to regain lost defense business.

In Washington, Sen. Hart (D., Mich.), is now tabulating results of a questionnaire he sent 3000 Michigan firms concerning their government contracts.

Management officials were asked by Hart if they were aware of all the avenues leading toward government contracts. In particular, question was raised whether companies had used such devices as claiming small business preference in seeking government contracts.

New Life for Renegotiation

Three Years More—Government renegotiation of defense contracts is to continue until at least mid-1962, Congress has decided.

The Senate last week voted to extend to June 30, 1962, the federal authority to review and adjust contract profits. Earlier, the House had approved a four-year extension of this authority.

The renegotiation law was to have expired on June 30 this year. The Eisenhower Administration had proposed extending it to Sept. 30, 1961.

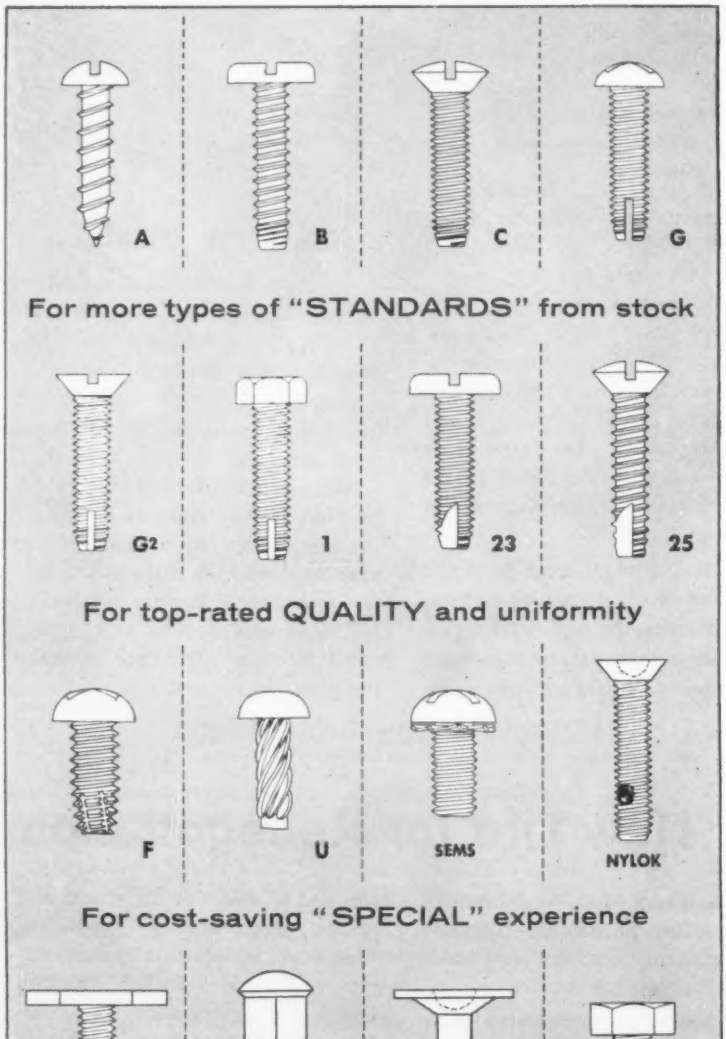
Study Military Policy—An important part of the Senate action was a provision for a complete study of military procurement policies and practices by the House and Senate Armed Services Committees. This would be followed by a Senate-House Internal Revenue Taxation Committee examination of procedures under the renegotiation law.

The Senate also endorsed an amendment to remove from the law the authority to place a profit ceiling on a contract subject to renegotiation. Certain maritime contracts have a built-in profit ceiling; however, they have been subject to renegotiation. Purpose of its amendment, the Senate says, is to free the contractor from the profit limitations in the contract. Profits made under an individual contract still would be reviewed by the federal price adjustment board.

Count on *Continental* to show you why

you can measure the difference in assembly dollars

when you use the right type for the job



Which fasteners will serve best and save most in your assemblies? Many types of screws look much alike, but the difference between the right and wrong choice for your job can often make a big difference in assembly costs.

Since Continental makes and supplies *all* types, their recommendations are unbiased. They can tell you if you should be using some "standard" you have overlooked. Or, if a "special" will save you most, you can rely on Continental's specialized experience to design and produce it at the lowest possible cost.

CHECK YOUR ASSEMBLIES

Find out where Continental's cost-saving ideas can cut your assembly costs. Talk to a Continental Assembly Specialist. For prompt service, write or phone: Continental Screw Co., 451 Mt. Pleasant St., New Bedford, Mass.

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HY-PRO TOOL COMPANY . . . DIVISION
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WOOD • MACHINE • TAPPING
THREAD FORMING •
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HY-PRO PHILLIPS
INSERT BITS AND HOLDERS

Seller's Roadmap for the West

Latest List of New and Expanding Companies

The range of products made in the West Coast area keeps increasing.

Here's an up-to-date rundown on companies either setting up shop or expanding their markets. —By R. R. Kay.

▪ The industrial upsurge on the Coast continues without letup.

But there's more to the story than the number of new and expanding metalworking firms.

Wider Base—Important fact: The variety of products made and assembled in the area keeps widening. This means a stronger base in the Coast's economy.

Here are some new and expanding firms in the market for your products and services. They're mostly in southern California:

From Shutters to Pipe—Dek Industries, Inc., East Los Angeles—aluminum shutters, wall tile, patio covers. Vitri Finish, Inc., City of Industry — architectural porcelain enameled panels.

Zila Mfg. Corp., Gardena—screw machine products. Millrich Engineering Co. Div., International Electronic Research Corp., Burbank—machine shop. Sugden Engineering Co., Bell Gardens—furnace pipe and fittings.

Water Heaters, Rocket Drives—Rocketdyne Div. North American Aviation, Inc., Canoga Park—liquid propellant rocket engines. C-B Equipment, Inc., Lynwood—tank truck valves and domes. Alm Mfg. Corp., Los Angeles — automotive parts, outdoor furniture, unicycles.

Cam-Stat, Inc., Los Angeles—controls for furnaces and electric water heaters. R. O. Roberts Co., Inc., Santa Fe Springs—airborne heat exchangers and radar equipment. Streve Enterprises, Los Angeles—heating appliances.

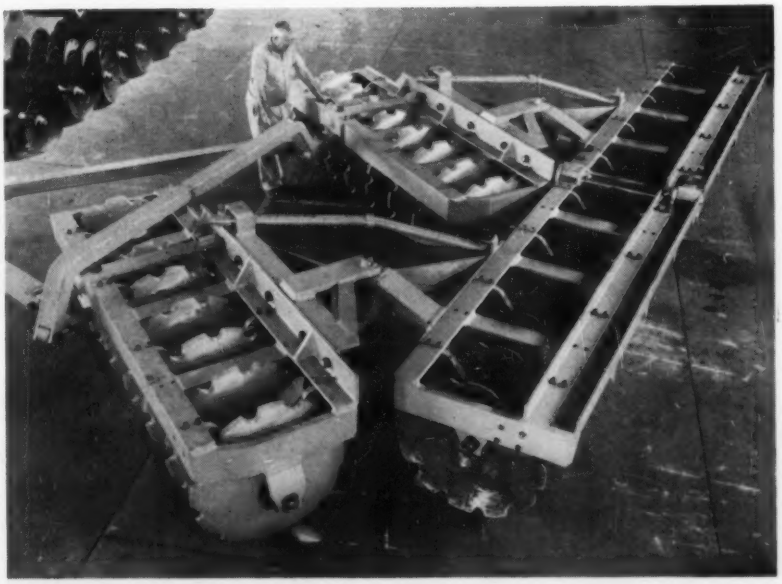
Solenoids, Furniture—Paramount Metal Fabrication, Inc., Paramount—water tank trucks, truck beds. Skurka-Langdon Engineering Co., Los Angeles—aircraft motors, solenoids, electric motors. Consolidated Systems Corp., Monrovia—instruments. Transdynamics, Inc., Burbank — electromechanical equipment.

Virco Mfg. Corp., Gardena, Calif.—school and home metal furniture. V & M Precision Grinding Co., Los Angeles—grinding. Del Mar Engineering Laboratories, Los Angeles—aircraft parts.

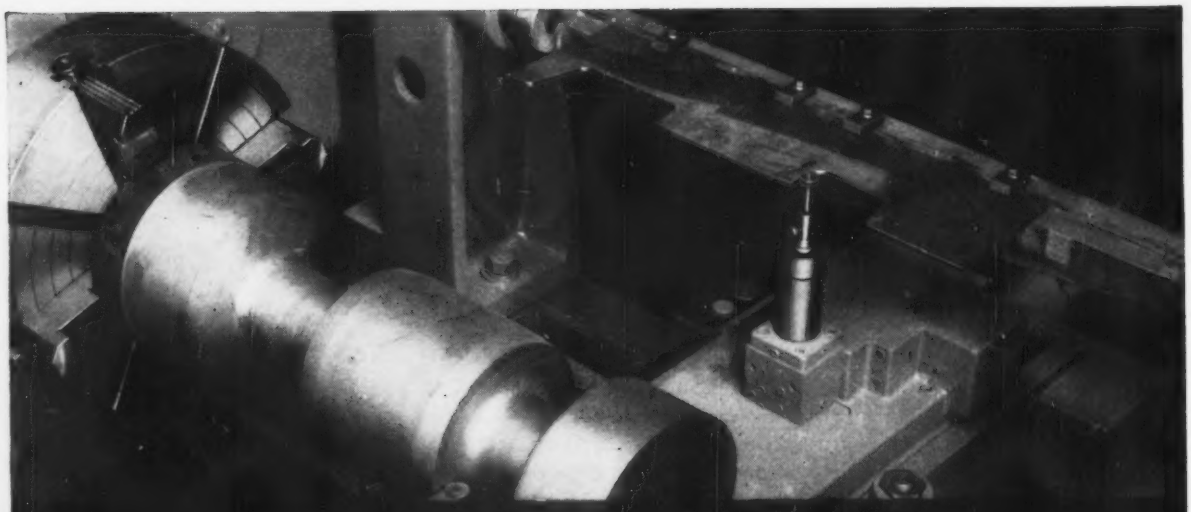
Valves and Controls — Durston Mfg. Co., Pasadena—house-trailer hardware. Hydraulic Research & Mfg. Co., Burbank—servo valves and systems. Westmetal Products Co., Los Angeles—metal stamping and deep drawing.

Lasar Mfg. Co., Inc., Los Angeles—meat cutting machines and grinders. Gene D. Priddle Co., Montebello—instruments and controls. Atlee Components, Inc., North Hollywood—mounting clips and heat sinks.

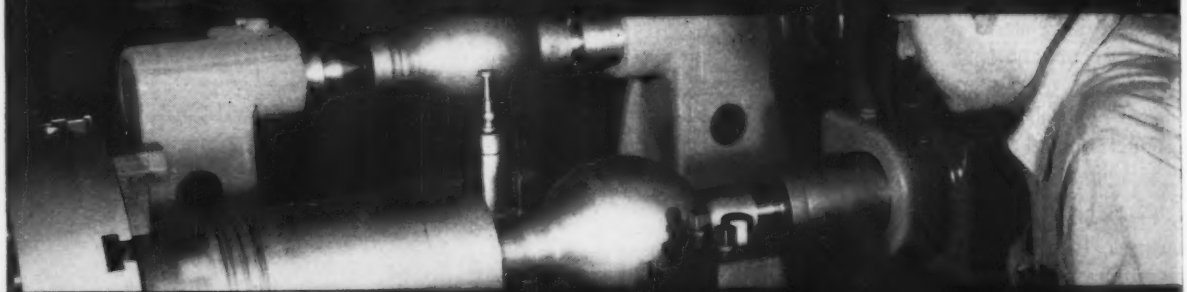
Getting Ready for Lots of Cutting Up



MAMMOTH DISK HARROW: Large squadron disk harrow built by Towner Mfg. Co., Santa Ana, Calif., is designed for maximum mixing action. Front two units operate on 60° angle to rear two units. Steel for the harrow was provided by Bethlehem Pacific Coast Steel Corp.



trace from flat or round templates



with LeBlond's new 90° Tracer

available on 13", 16", 20", 25" and 32" Heavy Duty Lathes; 16", 20", 25", 32" and 40" Standard Duty Lathes

EXCLUSIVE ADVANTAGES: No loss of swing capacity (raises unnecessary). Tracer system allows full horsepower at tool.

All hydraulic controls conveniently located at apron — change from trace to conventional simply by adjusting two nuts at apron.

No overarms or other obstructions to loading templates — all components, including hydraulic pump and tank, integral with cross slide.

Positive mechanical linkage between stylus and tool slide — no strain on cross feed screw and nut.

Tolerance — .001" on diameter; .001" on shoulder length.

Write today for descriptive bulletin.

...cut with confidence

THE R. K. LeBLOND MACHINE TOOL COMPANY,
CINCINNATI 8, OHIO

LeBLOND of Cincinnati

World's Largest Builder of A Complete Line of Lathes.

How to Cut Your Piercing Costs

Wiedemann Machine Says "Templamation" Is Answer

New concept in short-run piercing will cut piercing costs 60 to 90 pct, company asserts.

"Templamation" involves use of a trio of Wiedemann machines, including template maker. —By E. J. Egan, Jr.

Would you like to lop 60 to 90 pct off your present costs on short-run piercing jobs—the kind where you punch openings of various shapes and sizes into equipment panels, electronic chassis, machine parts and the like?

You can save this kind of money with "Templamation," says the Wiedemann Machine Co., well-known builder of turret punch presses. The word was coined to describe a new concept in short-run piercing. Company officials say it's as close as you can get to the production advantages of automation without using automatic controls.

Three Machines Involved — As demonstrated in the company's plant in King of Prussia, Pa., Templamation uses a trio of basic Wiedemann machines. One makes a template which determines the location of openings to be pierced in an actual workpiece.

The second machine inspects these templates with speed and extreme accuracy. The third machine, kingpin of the trio, is a regulation turret punch press which does the actual piercing. With an accurate template to guide him, an operator of one of these presses will make up to 3600 "hits" per hour.

Role of Template Maker — Highly important to the three-unit Templamation setup is the template making machine—the new Wiedemann Coordinator (See cut). It locates and drills ¼-in. diam holes into flat sheets of ⅛-in. thick steel in a single continuous operation.

There is no time-consuming manual layout involved. The blank is positioned over the drill in accordance with specified X and Y centerline dimensions. Precision optical scanners and graduated scales insure positioning accuracy (within ±0.002 in.) for hole drilling.

Tool Orders Drop

Net new orders for metal cutting and forming tools in May failed to maintain the uptrend that had been underway since the beginning of the year. Total for both types of equipment is estimated at $48.1 million by the National Machine Tool Builders' Assn. The April total was $53.2 million.

A sharp drop in foreign orders caused most of the May decline. Out-of-the-country demand for metal cutting machines fell off to $2.7 million from the April level of $5.2 million. Foreign customers bypassed U. S. builders of metal forming equipment, too, ordering only $450,000 in new machinery during May in contrast to an April total of $1.1 million.

Template Maker Saves Time

SKIPS LAYOUT: Wiedemann Coordinator locates and drills 100 or more holes per hour. Drill feeds up through a carbide bushing (insert).

INDUSTRIAL BRIEFS

Vermont Tap Buys Hommel—Vermont Tap & Die Co., Lyndonville, Vt., has purchased the Hommel Corp. of Grove City, Pa. Machinery and equipment for manufacturing Hommel powered screwdriver bits will be moved to the Vermont plant.

Metal Spinner — A new metal spinning company has been formed to serve the missile, rocket, aircraft, and electronic industries. Known as Spintek, Inc., the company's plant is located at 6850 N. Vineland Ave., N. Hollywood, Calif.

Steel-Ceramics Merger—The Indiana Steel Products Co., Valparaiso, Ind., and General Ceramics Corp., Keasbey, N. J., are planning to merge. Stockholders of both companies will be asked to approve the terms at special meetings, which are expected to be set for late August. Combined sales volume of the two firms for '59 is estimated at about $20 million.

Specialty Warehouse—The Carpenter Steel Co. has opened its new mill branch warehouse and specialty steel service center in Fort Washington Industrial Park and Office Center in suburban Philadelphia. The center will serve the Delaware Valley area for Carpenter's full line of specialty tool, stainless, alloy, high temperature, and electronic steels.

"Do you people have an easy-payment plan?"

Liaison in Automation—Consolidated Systems Corp., Monrovia, Calif., has signed an agreement with Transdynamics, Inc., Burbank, Calif., under which Transdynamics will provide engineering and manufacturing liaison between CSC and users of instrumentation systems in the Seattle-Richland area of Washington.

After 119 Years—The C. S. Mersick & Co., New Haven, Conn., has recently been purchased by The Norwalk Tank Co., Inc. of South Norwalk, Conn. The 119-year-old Mersick Co. will continue to operate at the same location and with the same lines of merchandise. A program of improvement and expansion is being planned.

In Balance—Aero Supply Mfg. Co., Inc., Corry, Pa., has added to its product line a precision balancer for grinding wheels. This new type balancer is for internal, external, centerless, and center grinding machines. Savings in balancing time with the Aero balancer are said to be 80 pct or more.

Joint Assets—Dana Corp., Toledo, has acquired the Rzeppa constant velocity universal joint assets of the Gear Grinding Machine Co., Detroit. Rzeppa will be operated as a separate division of Dana and will remain in its present facilities in Detroit.

Robertson Chair — The A. W. Robertson chair in economics has been established at Allegheny College, Meadville, Pa., with a grant of $250,000 from the Westinghouse Educational Foundation. Present for the ceremony in Pittsburgh was Mr. Robertson, still active in business and civic affairs, and G. A. Price, chairman of the board of Westinghouse.

Jet Silencers — Chance-Vought Aircraft, Inc., Dallas, has ordered three semi-portable jet run-up silencers from the Metal Products Div., Koppers Co., Inc., Baltimore, Md. The silencers will be used during testing of Navy F8U fighters. Delivery is expected in July.

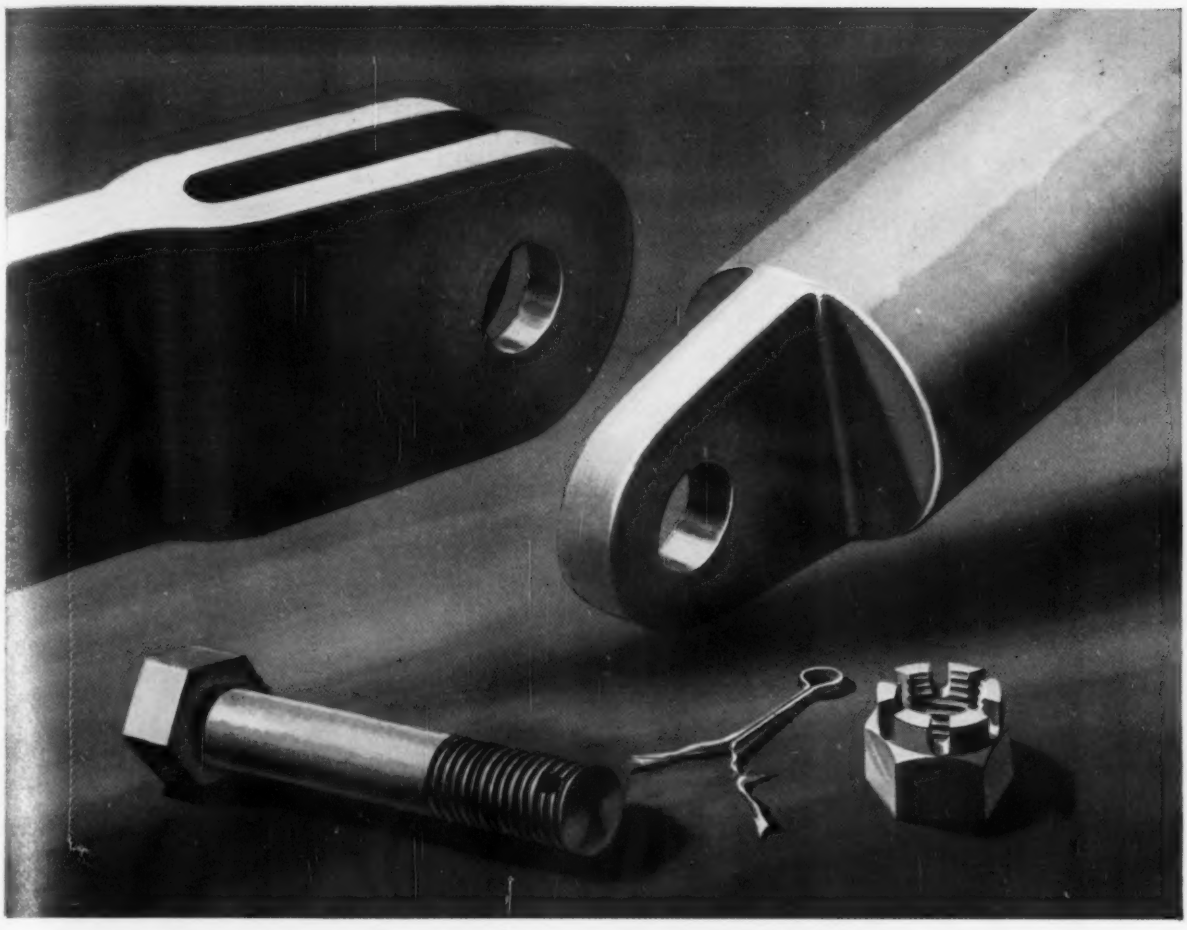
Best Industrial Film—The annual Chris Award, for the best film produced in the business and industry category during the preceding year, has been awarded to Denison Engineering Div., American Brake Shoe Co., Columbus, O. The film award was made for Denison Engineering's "Design for Power," which presented the advantages of high pressure hydraulics to designers and manufacturers of heavy duty equipment.

Ultrasonics Plant—One of the largest single plants in the U. S. devoted exclusively to ultrasonics was opened June 23, in Plainview, Long Island, N. Y., by Acoustica Associates, Inc. The Plainview plant consolidates the company's executive headquarters and Eastern Div. production and research operations previously conducted in four different plants.

Steel Merger — Intervale Steel Corp., Detroit, a steel processing company, has merged with the Barry Universal Corp., producers of cold rolled strip steel. Intervale is now a division of Barry Universal Corp. Annual business for '59 should approximate $7.5 million.

Scientists Join NASA—Two scientists from Westinghouse Electric Corp., have been named to special committees of the National Aeronautics & Space Administration. M. A. Schultz will serve on the Research Advisory Committee on Nuclear Energy Processes, Dr. Clarence Zener, was appointed to the Research Advisory Committee on Materials.

Norton Buys G & E—Norton Co., Worcester, Mass., has purchased the inventories, machinery and equipment, drawing, designs and other assets of Gould & Eberhardt, Inc., Irvington, N. J. Manufacturing of G & E's line of shapers and gear hobbing machinery will be continued in Worcester in Norton's machine tool plant. Sales of the G & E line will be continued through their present distributors.



The case of

THE ALMOST PERFECT DESIGN

This is a closeup of an equipment failure. Somewhere in the basic design, someone forgot to specify a nut that would hold fast. Now the entire piece of equipment is idle. Does it matter how good the overall design is?

The most brilliant engineering concept can be obscured or cancelled out by the failure of components. In the final analysis, then, a design which does not include fail-safe performance for the benefit of the user—and the protection of the maker—is inefficient and uneconomical. In the eyes of the customer, a failure of the smallest part is failure of the unit.

For bolted connections, it is possible to obtain "design insurance"... an extra margin of operating dependability that can mean the difference between satisfaction and a field breakdown . . . by specifying an Elastic Stop® nut with the failure-proof red nylon locking insert. The nylon insert will not destroy bolt threads or finishes; it is non-galling; it will withstand severest vibration, shock and impact loads; and it can be re-used over fifty times on a bolt of standard quality.

ESNA offers a broad line of standard and thin height hex nuts, and a size range from 0-80 to 3". Also many special configurations to solve your unusual design problems. For detailed information and photos showing how the designs of some of America's foremost manufacturers of heavy equipment have utilized Elastic Stop nuts for critical bolted connections . . . write to Dept. S32-777, Elastic Stop Nut Corporation, 2330 Vauxhall Road, Union, New Jersey.

DOUBLE DEPENDABILITY

The dependability built into every Elastic Stop nut builds itself into the dependability of every product on which it is used.

ELASTIC STOP NUT CORPORATION OF AMERICA

ESNA

Ohio Rolls

shaping metal for all Industry

OHIO IRON AND STEEL ROLLS

Carbon Steel Rolls	Flintuff Rolls	Denso Iron Rolls
Ohioloy Rolls	Double-Pour Rolls	Nickel Grain Rolls
Ohioloy "K" Rolls	Chilled Iron Rolls	Special Iron Rolls
Nioloy Rolls	Forged Steel Rolls	

The Ohio Steel Foundry Co.

LIMA, OHIO

LIMA... Virtually at the center of the steel industry

PLANTS AT LIMA AND SPRINGFIELD, OHIO

J. L. Ashby, named president and chief executive, **Kaiser Steel Corp.**

Green River Steel Corp.—**N. C. Walker,** named executive asst. to the president.

John A. Roebling's Sons Corp.—**W. C. Ridge,** appointed executive vice president.

Kaiser Aluminum & Chemical Sales, Inc.—**W. B. Leach,** named vice president.

Air Reduction Sales Co.—**E. S. Twining, Jr.,** appointed vice president, marketing.

U. S. Steel Corp.—**J. W. Todd, Jr.,** appointed asst. vice president-sales-distribution.

Olin Mathieson Chemical Corp.—**F. A. O'Connell, Jr.,** appointed labor counsel.

Kaiser Aluminum & Chemical Corp.—**C. A. Smith,** elected a vice president.

Laclede Steel Co.—**S. T. Gay, Jr.,** appointed asst. district sales manager, Chicago.

Allis-Chalmers Mfg. Co.—**R. S. Hubbell,** appointed asst. to the vice president, staff operations.

SKF Industries, Inc.—**W. J. Brickley,** appointed manager, labor relations.

American Society for Metals—**P. M. Unterweiser,** appointed associate editor, Metals Handbook.

The Cincinnati Milling Machine Co., Meta-Dynamics Div.—**H. W. Carlisle,** named manager.

Leeds & Northrup Co., Foreign Sales Div.—**W. C. Roxby,** promoted to manager, Philadelphia.

Inland Steel Products Co.—**F. L. Wood,** elected vice president, operations, and a director.

Copperweld Steel Co.—**M. G. Manker,** named Chicago district manager.

The R. K. LeBlond Machine Tool Co.—**R. E. McKee,** appointed sales manager.

D. A. Rhoades, elected president and chief executive officer, **Kaiser Aluminum & Chemical Corp.**

Continental-Diamond Fibre Corp.—**R. S. Handly,** appointed manufacturing manager, operations, tri-state area, and **E. F. Heffernan, Jr.,** as Bridgeport, Pa., plant manager.

The Lamson & Sessions Co.—**P. J. Rudden,** appointed asst. treasurer.

Crucible Steel Co. of America—**Dr. F. C. Langenberg,** appointed manager, process research.

Heppenstall Co.—**V. H. Lanahan,** appointed purchasing agent, Pittsburgh plant.

John Moxon, elected president, **The Carpenter Steel Co.,** Reading, Pa.

F. R. Palmer, elected chairman of the board, **The Carpenter Steel Co.,** Reading, Pa.

J. J. Jaeger, elected president, **Pratt & Whitney Co.,** West Hartford, Conn.

IN FASTENERS SOUTHERN IS

the source

Southern has many customers who know that for every screw requirement, Southern is the source "from which all fine fasteners flow." Southern is proud of being recognized as the source for customers who order and receive screws of highest quality, on time, and at a fair price.

If you haven't tried Southern as the source for your requirements, one order will convince you that you've been missing something. Write for Southern's current Stock List. Address: Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

Manufacturing and Main Stock in Statesville, North Carolina
Warehouses: New York • Chicago • Dallas
Los Angeles

Machine Screws & Nuts
Tapping Screws
Wood Screws
Stove Bolts
Carriage Bolts
Dowel Screws
Hanger Bolts
Drive Screws

How To Get More For Your Metalworking Dollar

Mechanical Fasteners

IN THIS FEATURE

Talk to a random group of metalworking executives about saving money on mechanical fasteners and it's surprising how many will scoff at the idea.

"What's there to get excited about?," is a typical reaction. "A few nuts and bolts? That's penny-ante stuff."

In a way, it's understandable why a man who's used to approving major capital expenditures might feel this way. His vision of mechanical fasteners probably includes the last household assortment he picked up at his local hardware store.

But the executive who looks at his company's purchases of fasteners in this offhand way is using the wrong frame of reference. American industry buys about a billion dollars' worth of fasteners every year for specific assembly needs.

Your own company's annual bill for fasteners may run to thousands, even millions of dollars. This is anything but penny-ante business.

In fact, the way you buy and use these products may represent one of your biggest potential cost-cutting areas.

Cut Down On Fastener Types

Many companies misuse too many of the wrong kinds of mechanical fasteners.

Standardize on fewer types and sizes for lower costs all along the assembly line.

▪ If you're really curious about getting more for your fastener dollar, take the time to see how much you spend for these items, and where they're used.

Check your purchasing department to see how many different types it buys. Visit the stockroom to see what this variety looks like in the bins and on the shelves.

Too Many Types—You may be amazed, as the management of one company was, to find that 23,000 different types and sizes of mechanical fasteners were carried in regular inventory. Too many? Of course it was.

A standards engineer got the go-ahead to make some sense out of this bewildering variety. He lopped off 1700 types and sizes on his first try, and he's confident he can eventually cut the former total in half.

If you suspect that you might be overstocked on unnecessary types of fasteners, take the next step. Make it clear to all concerned that now is the time to become fastener-dollar conscious.

Only the Start—There's added incentive if you remember that the fastener itself is only the starting point. Careful attention to fastener selection and use is money in the bank to be sure. But it's only a token to what you'll eventually save in terms of lower assembly costs.

Your goal, then, is simply this: To buy the fewest types and sizes of fasteners that will do the best possible assembly job at the lowest possible cost.

To reach this goal you need a track to run on. Don't start trying to save money in a half dozen places at the same time.

Don't Force Redesign—For example, you may eventually want to redesign some of your assemblies. But forcing a wholesale redesign program at the start of your drive to cut fastener costs may be putting the cart before the horse. If changes in design suggest themselves, let them come naturally. Your first move is simply to cut down on the variety of fasteners you buy and use.

Start by giving this trimming-down job to some resourceful and intelligent person. Preferably, it should be someone from your stand-

Simple Rule of Thumb

Sound advice on stretching your fastener dollar comes from John S. Davey, left, sales vice president, Russell, Burdsall & Ward Bolt & Nut Co.:

"The fewer types and sizes of fasteners you use, the lower your buying cost, stock handling and assembly cost."

Don't Overspecify—"The design engineering department is the best place to start a program of simplification," Mr. Davey says. "If the engineer has unlimited scope in selecting nuts and bolts, he's likely to overspecify, creating unnecessary specials and headaches to both production and purchasing.

Use Your Standards—"Get the design engineer thinking in terms of what the purchasing department can buy, and the production department can use. Give him your standards taken from existing recognized standards."

FEWER TYPES: A well-managed standards program assures maximum fastener savings at Rockwell Mfg. Co.

ards engineering department. If you don't have a standards engineer, hire one. Give him full responsibility and the authority to back it up.

Authority is Vital—This matter of authority is more than just academic theory; it's vital if your standardization program is to succeed. Look at it this way: Any man who starts trying to simplify a hodgepodge of fastener types and sizes is bound to step on a few sensitive toes.

Temperament blocks millions of dollars in fastener savings every year. Some standards engineer suggests getting rid of a certain type of fastener and the man who made the original choice rebels at the idea. It takes tact and real authority to override these objections. Some companies never make it.

Passive Resistance—But this type of active or even violent resistance to change isn't the only stumbling block your standardization enforcer may have to hurdle. He might run into a passive—even a subconscious—form of resistance that is just as serious, just as likely to cost you money.

A prime example of this mild but unyielding resistance to change is offered by a well-known manufacturer of business machines. In each machine of a certain type the company uses a half-dozen nuts that are slightly off-standard. It's not a matter of thread factors, as you might think. It's the outside dimensions that don't coincide with present-day standards of width.

Involves Big Loss—"I'd guess the company is losing $20,000 a year because it persists in using these nuts," says an expert fastener engineer. "Functionally, there's nothing that requires them to be an odd size.

"It just seems that back around 1908 someone started buying nuts machined from certain sizes of hex bars that aren't standard today. Nobody wants to stick his neck out to break the habit despite the obvious savings a switch to standard size nuts would bring."

Your standards engineer should be able to overcome these forms of resistance to change if he's armed with full authority.

Seek Expert Advice—Warn him,

Standardizing Saves on Hex Nuts

Two of Rockwell Mfg. Co.'s power tool divisions were using 123 different types of commercial and special hex nuts. Total number used annually ran to about 1,581,000.

The company's central standards department, under the direction of Mr. F. R. Magill, whittled the 123 types and sizes down to 54 that were actually needed.

Only a few kept their original specifications. Twenty-seven were changed to a double-chamfered form, and 17 were switched to lower-priced commercial types.

Cut Selection Time — Double-chamfered nuts cost the company no more, but did cut 60 pct off the time formerly needed to select nuts and put them on screws properly. Industrial engineers estimate this time saving to be worth 30 cents per hundred, or $2110 annually for 703,320 chamfered nuts used.

Lower-cost nuts were used in 542,370 instances. Some had been special types. Average savings here amounted to 56 cents per hundred, for an annual total of $3037.

Actual savings of over $5000 on hex nuts alone in just two divisions shows what can be done. The savings are worth many times $5000 in terms of the sales volume that must be achieved to earn an equivalent amount.

though, not to try to overwhelm his associates with his knowledge of fastener technology. Insist that he call in experts who can give him unbiased advice about his job of simplifying your fastener needs. This service is available from every reputable manufacturer of fastening devices just for the asking, and it can be invaluable.

In a short while, your standards engineer should show you enough results to justify your giving him the job. The obvious reductions he will be able to make in your fastener inventory alone will save big dollars in purchasing department and stock handling routines.

Moreover, worthwhile savings will start to show up on assembly lines. Fewer sizes and types of fasteners lead to simpler assemblies, less confusion about which fastener to use, and more intelligent application of these key items.

Prepare a Manual—As you gradually standardize on certain types and sizes of fasteners for your own use, be sure they're designated as such in some form of manual for your design engineers, buyers, and production personnel.

Why make up your own manual? For one thing, there are many types of "standard" fasteners that perform similar functions. Some of yours may conform to certain military standards, others to particular industry standards, still others may match a half-dozen outside code numbers.

It makes good sense to list these outside standard numbers wherever they apply, but in your company manual, put a standard number of your own choosing at the head of the list.

Here's a Sample—To better explain the reason for your own manual and your own standards for fewer types and sizes of fasteners, here's a paragraph from a typical manual:

"Head Styles for Screws—Eight of the numerous head styles for machine and tapping screws have been standardized by the American Standards Assn. But because such screws are used basically for only two types of assembly (flush or above-flush), the (name of company) has standardized on just two head styles: (1) flat head for flush assembly; (2) pan head for above-flush assembly."

Designers Like This—The manual follows this paragraph with more detailed information, including the company's own standard numbers for flat and pan head screws. The same chapter on screws and bolts also covers screw threads, screw lengths, length of threaded engagement, and materials and finishes. Design engineers can't go wrong with such help.

Other sections of the manual nail down company standards pertaining to (1) nuts and threaded inserts; (2) washers; (3) special fasteners, such as quick-operating types, captive thumbscrews, and self-locking screws; (4) rivets.

Standards Earn Discounts—Fasteners conforming to these company standards are bought in huge quantities to earn maximum discounts. Kept in ample supply, they avoid troublesome and costly manufacturing delays; they also simplify and speed repairs to equipment in the field.

Your own standards for fasteners needn't be inflexible. At times, a new assembly may benefit from a type that doesn't appear on the approved list.

In such cases, some companies insist that a specially colored requisition form be used for any non-standard item. This alerts both the purchasing and standards engineering department to double check before issuing the order to buy. In time, of course, the non-standard item may appear in the company manual, but only if it helps stretch the all-important fastener dollar.

Look Sensibly at Screw Threads

Many controversies exist about various screw-thread factors. They needn't affect you if you understand certain fundamental concepts.

▪ The metalworking industry uses threaded fasteners—bolts, nuts, cap screws, studs, self-tapping screws and the like—in huge quantities.

Some 250,000 types and sizes of these items are covered by recognized standards. And as one fastener manufacturer observes, "It seems as if some design engineers aren't happy unless they use them all."

To curb this tendency if it exists in your company, remember the simple rule of thumb from Part 1 and apply it religiously: "The fewer types and sizes of fasteners you use, the lower your buying cost, stock handling and assembly cost."

Which Thread?—The question of whether to use a coarse or a fine threaded fastener for a particular application is certainly one you'll have to resolve in applying the rule of thumb. Quite often it's a controversial point.

The American Standard coarse-thread series, designated UNC, is the one used most widely for bolts, nuts, screws and other threaded items. It is recommended where wall thicknesses will accommodate the thread dimensions. The coarse-thread series makes for rapid assembly and disassembly, especially if there is a possibility of thread damage or corrosion.

Fine Threads Adjust—The fine-thread series, designated UNF, is widely used in automotive and aircraft assembly, particularly where wall thicknesses or other conditions require a fine thread. Quite often, fine-thread fasteners are used to perform some adjustment function in an assembly.

Thread fit may involve still another question on many assembly lines: When to use Class 2A and 2B or Class 3A and 3B combinations? (The "A" in each class pertains to an external thread; "B" indicates an internal thread.)

How Classes Differ—These two classes differ from one another only by certain amounts of tolerance and allowance. Class 2A external threads, for example, have an allowance that tends to minimize galling and seizing during assembly. It also allows for plated finishes or other coatings.

The minimum diameters of Class 2B internal threads, however, are basic. Regardless of whether the threads are plated or coated, they afford no allowance or assembly clearance at maximum metal limits.

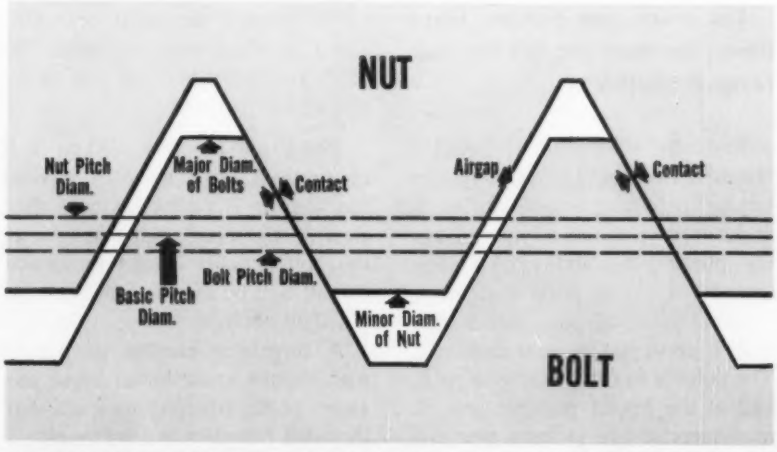
On the other hand, both the maximum diameters of Class 3A (external) threads and the minimum diameters of Class 3B (internal) threads are basic regardless of any plating or coating. Neither affords any allowance or clearance for assembly of maximum-metal components.

What is "Quality"?—This doesn't mean that Class 3A-3B fits are necessarily of better quality simply because there are no tolerances allowed. If a Class 2A-2B fit is suitable for most uses, as it is today, then it is a "quality" fit for the job and other aspects of quality become meaningless.

More misunderstanding than controversy attaches to two other thread factors you may be concerned about: (1) percent depth of thread; (2) length of thread engagement. As for the first factor, any engagement of threads in excess of 75 pct of thread depth adds nothing to the strength of the assembly. And it's generally conceded that when the length of engagement between a nut and bolt exceeds one thread diameter, you likewise add nothing to the strength of the joint.

When it comes to the relative strength of rolled vs. cut threads, the rolled variety is far stronger.

What's in a Fit?



WHEN PITCH DIAMETERS VARY: There is negligible change in thread strength between the tightest and loosest tolerances produced commercially.

UNDER HEAVY VIBRATION: Bolted connections will stay tight if they're properly designed and preloaded.

Stronger Joints Can Cost Less

The clamping force in a threaded fastener is a latent property until you tighten it.

The more you tighten these items, the more you get for your fastener dollar.

▪ Basically, when you buy threaded fasteners for an assembly, you're buying holding power. Putting it another way, you're buying clamping power—the ability of mating threads to clamp parts together.

How much of this power you need is up to you, or your customer. The point is to make sure you get it, and at the lowest possible cost. It may surprise you to learn that you can often get all the holding power you need—and a bit more for good measure — by using smaller high-strength fasteners and fewer of them. It's just another way of getting more for your fastener dollar.

To develop the point, let's talk about standard nuts and bolts, the kind you probably use on many assembled products.

The Usual Troubles—When such connections come loose in service, the answer is fairly obvious: they weren't tightened well enough. If the bolt actually breaks in service it may well be for the same reason: not tight enough.

A surprising number of people who should know better seem unaware of the tremendous loads that threaded fasteners will withstand, if only they are tightened properly.

It can only be a lack of understanding when a major company tells its design engineers the maximum allowable load for a ½-in. diam. bright cap screw is only 500 lb. Actually, the minimum breaking load for this standard steel fastener is 9630 lb. Moreover, it won't start to elongate permanently until it passes the yield (proof load) point with an applied load of more than 7800 lb.

Underrated, Again — The same company's load-rating tables show 1400 lb as the maximum allowable design load for a ¾-in. diam bright cap screw. Yet this fastener has an actual minimum breaking strength of 21,380 lb, and a proof strength of 17,350 lb.

Fastener engineers say these unrealistic load limits turn up time

and again in design specifications. Apparently the idea is that an extra fat bolt offers an added safety factor, as does a thicker web in a steel beam. But this is not the way it works. The only safety factor in a bolted connection is directly related to the amount of preload you tighten into the bolt.

Fig. 1 shows what happens. If you wrench up the nut and bolt so the holding or clamping force (P) is greater than the external forces (T) tending to pull the connection apart, the assembly cannot loosen. This assumes that the preload will not be lost by any embedding of the bolt head or nut.

Preload is Key—If the preload is four times the expected working load, you have a safety factor of four. If it's less than the working load, you have no safety factor at all: the bolt will stretch some regardless of its size or alloy. When this happens, the bolted-together pieces will begin to come apart.

As an example, consider a ¾-in. diam bolt (proof load 17,000 lb) that is preloaded to a tension value of 7000 lb. Functionally, this fastener would be no better than a ½-in. diam bolt preloaded to 7000 lb although its proof load is only 7800 lb. Actually, a ⅝-in. diam bolt, preloaded to 10,000 lb, would be stronger than the ¾-in. bolt with its 7000-lb preload.

(It's important to remember that the grip length of any steel bolt, regardless of alloy, will stretch 0.001 in. for every 30,000 psi of tension it is subjected to.)

Example Proves Point — There are many examples to prove that preload in a tightened bolt may mean more to assembly strength than the actual strength of a bolt itself.

In one case, the bucket on a certain type of earth-moving machine kept working loose in service. The manufacturer kept increasing bolt size until finally the buckets were being put on with 1¼-in. diam

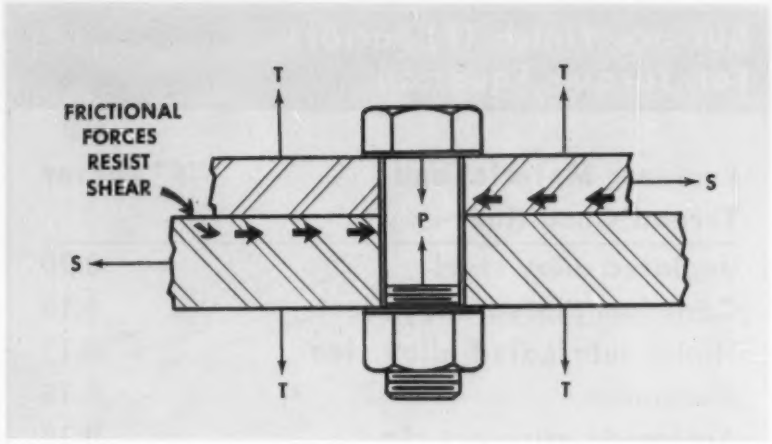


FIG. 1: If preload tension (P) in bolt exceeds the working loads sustained in service (T), a bolted connection cannot loosen or fail in fatigue.

ASTM AND SAE GRADE MARKINGS FOR STEEL BOLTS

Grade Marking	Specification	Material	Physical Properties: Bolt Size (inches)	Proof Load Min. (psi)	Tensile Strength Min. (psi)
	SAE—Grade 0	Steel	All Sizes	.....	.....
	SAE—Grade 1 ASTM—A 307	Low Carbon Steel	All Sizes	.....	55,000
no mark	SAE—Grade 2	Low Carbon Steel	Up to ½" Over ½" to ¾" Over ¾" to 1½"	55,000 52,000 28,000	69,000 64,000 55,000
	SAE—Grade 3	Medium Carbon Steel, Cold Worked	Up to ½" Over ½" to ⅝"	85,000 80,000	110,000 100,000
	SAE—Grade 5	Medium Carbon Steel, Quenched and Tempered	Up to ¾" Over ¾" to 1" Over 1" to 1½"	85,000 78,000 74,000	120,000 115,000 105,000
	ASTM—A 325	Medium Carbon Steel, Quenched and Tempered	Up to ¾" Over ¾" to 1" Over 1" to 1½" Over 1½" to 3"	85,000 78,000 74,000 55,000	120,000 115,000 105,000 90,000
BB	ASTM—A 354 Grade BB	Low Alloy Steel, Quenched and Tempered (Medium Carbon Steel, Quenched and Tempered may be substituted where possible)	Up to 2½" Over 2½" to 4"	80,000 75,000	105,000 100,000
BC	ASTM—A 354 Grade BC	Low Alloy Steel, Quenched and Tempered (Medium Carbon Steel, Quenched and Tempered may be substituted where possible)	Up to 2½" Over 2½" to 4"	105,000 95,000	125,000 115,000
	SAE—Grade 6	Medium Carbon Steel, Quenched and Tempered	Up to ⅝" Over ⅝" to ¾"	110,000 105,000	140,000 133,000
	SAE—Grade 7	Medium Carbon Alloy Steel, Quenched and Tempered, Roll Threaded after heat treatment	Up to 1½"	105,000	133,000
	SAE—Grade 8 ASTM—A 354 Grade BD	Medium Carbon Alloy Steel, Quenched and Tempered	Up to 1½"	120,000	150,000

Industrial Fasteners Institute

Surface Finish (F) Factors For Torque Equation

Fastener Material and Thread Condition	"F" Factor
Unplated alloy steel	0.20
Cadmium plated alloy steel	0.15
Highly lubricated alloy steel	0.11
Aluminum	0.15
Austenitic stainless steel	0.30

alloy bolts, heat treated to 150,000-psi tensile strength.

But these fasteners were torqued up with only 100 lb-ft in assembly, while at least 1500 lb-ft was needed for the type and size. When an application engineer suggested wrenching the original ¾-in. bolts with 350 lb-ft of torque, the buckets stayed tight.

Watch Overtightening—In another instance, a company switched to ⅝-in. diam bolts because the specified ½-in. diam size kept breaking in the bolt holes during the assembly operation. It wasn't surprising to the fastener engineer who was called in; he found the assembler using a three-foot wrench on the job.

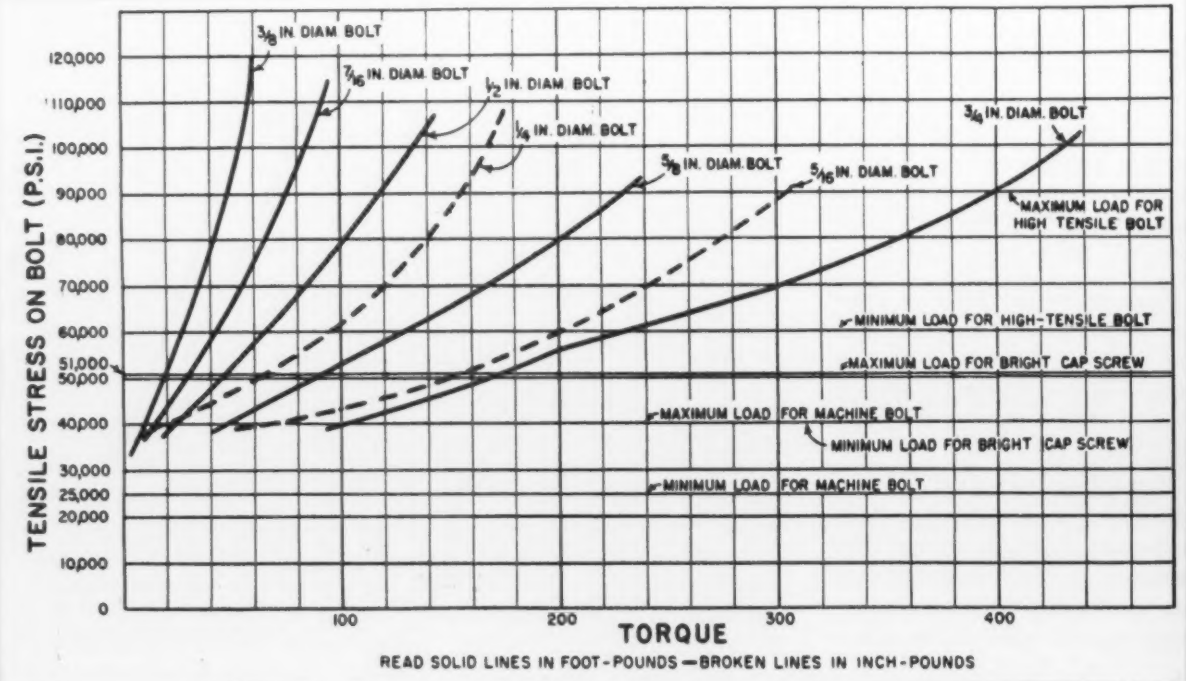
The engineer suggested that what the company needed was not bigger bolts but a torque-limiting wrench. Giving the assembler one of these wrenches and a few simple instructions solved the breakage problem, and the company returned to its use of the smaller, less expensive ½-in. diam fasteners.

How Much Preload?—How much should you preload a bolt? The ideal point is just below its yield strength or proof load point. If you're not going to reuse the fastener or make adjustments with it, you can load it well into the range where it will deform permanently. As long as it doesn't fail when it's being wrenched up tight, it won't fail in service. This assumes that the bolt and joint are adequate for any expected working load.

Torquing up a bolt to the ideal point involves two forces. One is the tension due to actual bolt stretch. The other is torsion, due to the friction between mating threads that must be overcome.

After you stop wrenching, only the tension force remains as your effective preload. For example, if

Suggested Torque for Steel Bolts



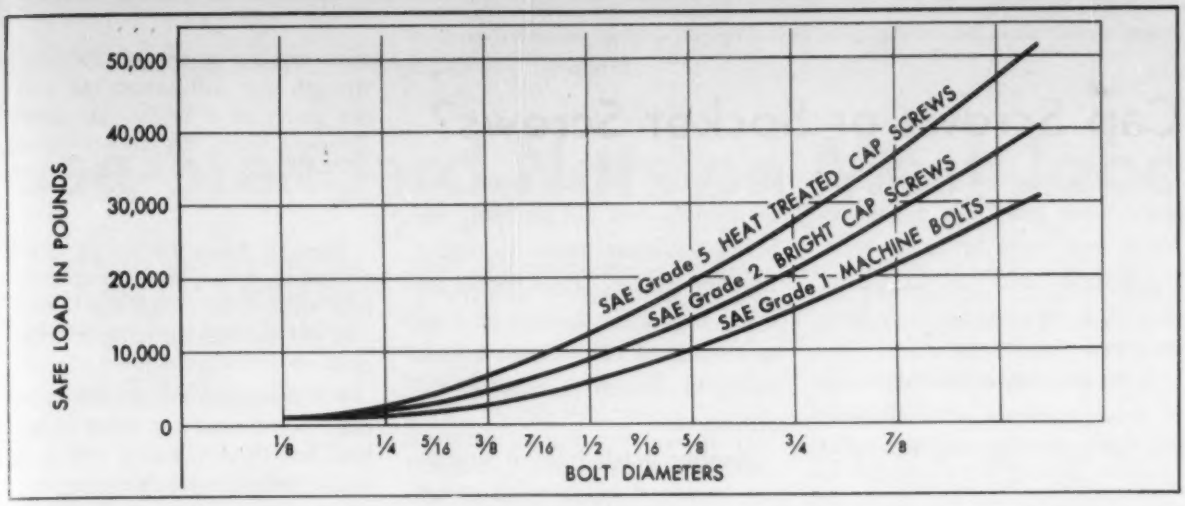


FIG. 2: Safe-load curves for steel bolts show, for example, that a ⅝-in. diam heat treated cap screw will withstand the same 20,000-lb load as a ¾-in. bright cap screw. The smaller screw also costs you less.

you apply 80 lb-ft of torque in tightening a certain ½-in. diam bolt, total tension and torsional stress in the bolt at that point is a bit over 70,000 psi.

Lose Torsion Stress—But as soon as you stop wrenching the torsional stress is released immediately. The residual preload tensile stress in the bolt is then about 63,000 or 64,000 psi.

How much torque must you apply to insure a residual preload just below the yield strength of the bolt? It's not easy to predict. Probably 90 pct of applied torque goes into overcoming friction, but the friction factor will vary according to the type of bolt material, and whether the threads are dry, lubricated, or plated.

Helpful Formula—You might try predicting required torque with the formula T = F x D x L, where T is torque in lb-in., F is the surface finish factor, D is nominal thread diameter in inches, and L is tension load in lb.

A value of 0.2 is about right for "F" in the formula for average friction conditions, for all diameters, and for both coarse and fine threads. An accompanying table lists more specific values for "F."

Still, the only sure way to find the torque you need for a suitable preload is to set up a pilot assembly and try it out. Use a good torque wrench, tighten a few bolts to the point of failure, and note the torque reading where failure occurs.

For your production assemblies, set the torque limit at 75 pct of the load that caused failure. An accompanying chart shows suggested torque values for various sizes of steel bolts.

Watch Flexible Joints — There is one exception to the principle that bolted connections should be torqued up tight, and the tighter the better. It's the flexible type of joint.

If you tighten such joints too much, you might destroy the flexible element—squeeze out the gasketing material, for example. Since you can't tighten the bolts too

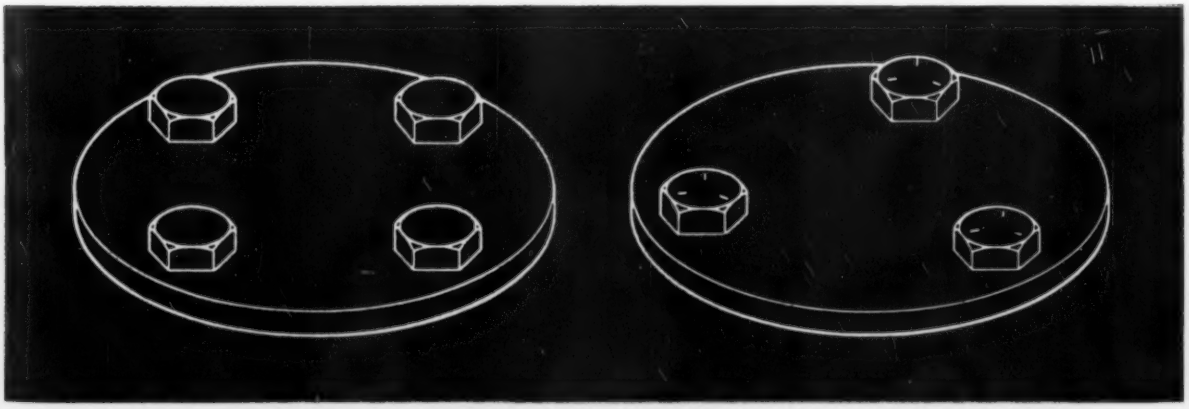


FIG. 3: Spacing three high-strength bolts at 120° (right) is a good way to stretch your fastener dollars.

Cap Screws or Socket Screws?

By all means, use a socket head screw when you have a counterbored hole or a space problem. But if these limitations don't exist, consider a cap screw for more holding power per dollar.

In an assembly where there were no space problems, a manufacturer was using the following variety of plated, socket head cap screws:

Quantity	Size	Cost
38	5/8-11 x 1¾	$10.18
48	½-13 x 1½	7.94
36	⅜-16 x 1	3.28
6	5/16-18 x ¾	.42
8	½-13 x 4	2.66
8	½-13 x 3	2.04
3	5/8-11 x 6½	2.36
	Total Cost for Socket Head Cap Screws	$28.88

A fastener engineer recommended substituting bright cap screws in the quantities and sizes listed, since the manufacturer did not apply sufficient tightening torque to require anything stronger. Total cost of the bright cap screw assortment came to only $4.88. This meant a clear saving of $24.00 per unit to the manufacturer.

Another point: Internal wrenching on socket heads won't always develop as much torque as needed for adequate preloading. When it does, the smaller bearing area of the socket head may tend to crush the surface on which it bears.

On the other hand, hex head bolts and cap screws may give you a stronger joint at less cost. These fasteners have ample bearing and wrenching surfaces and can usually be torqued up to a point near their yield strength.

much, what do you do if they come loose or fail in fatigue as a result of high cyclic loading?

Sometimes the only remedy is to take out the flexible element and design a rigid joint: a metal-to-metal flange connection, perhaps, instead of a gasketed one.

Eye Man With Wrench—There are many fastener dollars to be saved for any company that understands the importance of preloading and will see that the man with the wrench does the job properly.

For example, unless your bolted assemblies will be subjected to unusual corrosive or high-temperature conditions, three grades of carbon steel bolts or cap screws will probably satisfy most of your clamping needs.

Referring to the accompanying table of "ASTM and SAE Grade Markings for Steel Bolts," you'll see that SAE Grade 1 offers 55,000 psi minimum tensile strength; Grade 2, from 64,000 to 69,000 psi, in cold headed sizes; Grade 5, from 105,000 to 120,000 psi, according to bolt size.

Safe-Load Guide — Now check Fig. 2, which shows safe-load curves for three standard types of steel fasteners made to these SAE specifications: (1) the common machine bolt, made to SAE Grade 1, of 1010 steel; (2) the bright cap screw, made to SAE Grade 2, of 1018 or 1020 steel, cold worked; (3) the heat treated hex head bolt or cap screw, made to SAE Grade 5, of 1038 steel which has been quenched and tempered.

Notice the difference in allowable safe load for a given diameter that these curves indicate. There's a practical significance here, and this is it: in virtually every common size, the next smaller screw of the high strength type will furnish the holding power of a bright cap screw. To some extent, the same is true of the bright cap screw vs. the machine bolt.

Strength Costs Little—In terms of holding power, then, the stronger heat treated bolts and cap screws cost you less than the cheaper bright ones.

For example, you can use a 5/8 in. diam heat treated cap screw or hex head bolt (SAE Grade 5 with three radial dashes on the head) to withstand a working load of 20,000 lb. Or you can use a ¾-in. diam bright cap screw to withstand the same load. But because it's smaller, the 5/8-in. diam fastener costs you less.

Fig. 3 shows you one practical way to put this cost-saving idea to work. Three bolts positioned 120° apart around a common center will provide as stable a joint as the conventional four-bolt pattern. Assume that, as in the left-hand sketch, you would ordinarily use four ¾-in. diam bright cap screws to carry an 80,000 lb load safely. But as the right-hand sketch shows, three SAE Grade 5 heat treated cap screws of the same diameter will support the same load.

Double Savings—By altering designs to take advantage of this extra bolt strength you save two ways: (1) three high strength bolts cost less than four bright cap screws; (2) you have fewer holes to drill and fill for added savings in assembly.

In terms of the holding power you can buy with your fastener dollar, here's the way it figures out. A dollar's worth of holding power in an SAE Grade 5 cap screw or hex head bolt actually costs you $1.50 if you use bright cap screws, and $1.65 if you use ordinary machine bolts.

On a per-piece basis, machine bolts are still the least expensive, of course. Their use is recommended where they provide sufficient strength and the use of stronger bolts would not reduce the number required.

Use Standard Nuts on Most Jobs

A nut needs certain properties to apply and hold sufficient preload tension on a bolt. Standard nuts are well designed to do just that, and at the lowest overall cost.

▪ To properly preload a bolt for a tight joint, a nut must have (1) thread-shear strength greater than the breaking strength of the bolt, (2) enough height for ample thread engagement, (3) enough wall thickness to minimize dilation of the nut under load, and (4) sufficient bearing area to avoid crushing the surface on which it rests.

Essentially, a nut should be soft enough so its threads will deform plastically upon tightening. The threads thereby adjust to distribute the load rather than concentrate it unduly on the first few threads that engage the bolt.

Two Standard Types — Two series of nuts made to American Standard specifications (ASA B18.2—1955) satisfy these requirements. One, the standard "Finished" series, will usually give you the most for your fastener dollar. It provides good bearing area; enough height to sustain high thread tension; sufficient wall thickness to control nut dilation under load.

Nuts manufactured to "Heavy" series specifications are somewhat thicker from top to bottom than their "Finished" counterparts. They're also ⅛ in. wider across the flats in all sizes. They're most effective in the ½-in. to 1½-in. size range for applications involving big clearance holes, extra-heavy loads, and conformance to certain boiler codes.

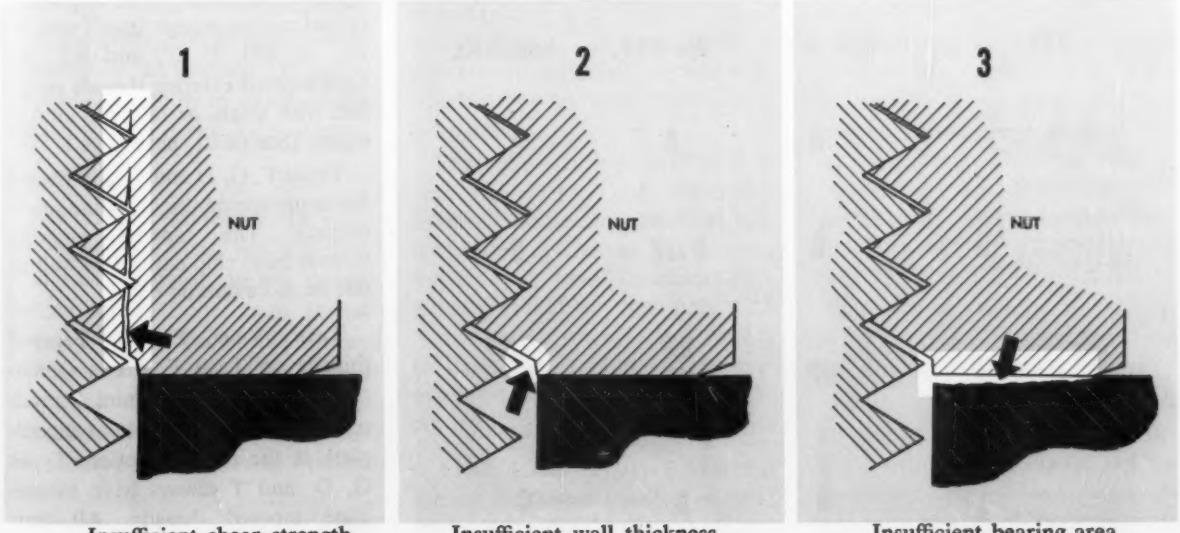
Various Locking Forms — For locking purposes, ASA standards include thinner jam nuts in both "Finished" and "Heavy" series. A combination of a regular nut and a jam nut makes a superior and economical locking device. However, the thinner jam nut should always be adjacent to the work surface; otherwise it takes the full tightening load, which it is not designed to do.

A variety of locknuts, which do not depend on bolt loading for locking action, are also made to standard specifications by many fastener manufacturers. Each type has a built-in feature for gripping either the bolt or the workpiece to impede or prevent loosening.

Nuts that lock by a spring action against both screw threads and workpiece surfaces are typified by the well-known Palnuts and Tinnerman Speed Nuts. These come in a wide variety of styles and sizes for rapid assembly work.

To simplify nut inventories, many companies that formerly stocked both square and hex nut sizes are now standardizing on the latter style, along with hex-head bolts.

Three Reasons Why Nuts Fail



Insufficient shear strength | Insufficient wall thickness | Insufficient bearing area

Pick the Right Tapping Screws

Handy self-tapping screws come in many types and head styles. To get more for your fastener dollar standardize on the minimum variety that suits your needs.

▪ The increasingly popular self-tapping screw puts a welcome stretch into many a fastener dollar. But here, again, your standards engineer must curb any tendency for the design department to use too many of the available types and head styles.

Analyze your assembly design factors, such as the types of materials to be joined and their relative thicknesses. Consider, also, whether you want permanent fastenings or components that can be disassembled and reassembled conveniently. Then assign your own standards numbers to the fewest types and sizes of tapping screws that will do these jobs.

Two Basic Types — Basically there are two types of American Standard tapping screws: (1) thread forming; (2) thread cutting.

Thread forming screws are shown on an accompanying chart as ASA types A, B, BP and C.

Type A is a gimlet-pointed, spaced-thread screw used primarily in light sheet metal, plywood, asbestos compositions and the like. Use it where you have a pierced or punched hole, where you need a sharp point for starting the fastener, and where the exposed point doesn't matter in the final assembly.

For Heavier Duty—Type B is a blunt-pointed screw with a somewhat finer pitch to its spaced threads than Type A. Use it for drilled holes in light and heavy sheet metal work, also in nonferrous castings, plastics, plywood, asbestos compositions and the like.

Type BP forming screws differ from the "B" type in that they have conical points. They are used primarily in assemblies where drilled holes are apt to be misaligned.

Type C screws have machine screw threads approximating the American National form, and come with blunt tapered points. They are used in drilled holes where this thread form is preferable to the spaced type. If chips produced by thread cutting types of screws are objectionable, Type C may be your answer. Be prepared to use plenty of driving torque with these fasteners, especially if you design for long thread engagement or use harder types of metals.

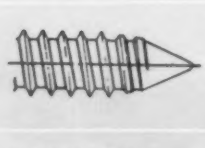
Try Cutting Types—In general, however, where you use hard materials and are apt to need excessive driving torque with thread forming screws, one of several thread-cutting types should do the job more satisfactorily and at less cost.

ASA classifies blunt-pointed thread cutting screws into Types F, BF, G, BG, D, T, and BT. All have tapered entering threads modified with single or multiple cutting edges. (See chart, next page.)

Types F, G, D and T have thread forms approximating machine screw threads. The tapered entering threads have chip cavities as well as one or more cutting edges.

Take Your Pick — Tapered threads on Type F screws (sometimes referred to as Paint Scraper screws) may be complete or incomplete at the maker's option. Types G, D, and T always have incomplete tapered threads. All four types, however, are suitable for use

Standard Thread Forming Screws

TYPE	A S A	MANUF.	FEDERAL
	A	A	A
	B	B or Z	B
	BP	BP or ZP	BP
	C	C	C

in such materials as aluminum and zinc die castings; steel sheets and shapes; cast iron; brass; and plastics.

Types BF, BG, and BT thread cutting screws have spaced threads and blunt points with one or more cutting grooves. Use them in assembling plastic materials, die castings, metal clad and resin impregnated plywoods, and asbestos products.

When load-carrying ability is not your major concern, determine the diameter of a tapping screw according to the gage of metal you're using. Choose a thread pitch which gives you at least one full thread engagement, and possibly more.

How to Specify—For example, if you're going to use a tapping screw in metal that is 0.062 in. thick, you might use either a #7 Type A or a #10 Type B. Both have 16 threads per inch. You might also choose a 5/16-18 screw in one of the thread cutting types. Any of the three will give you at least one full thread of engagement.

When load carrying ability is critical, you must use a tapping screw that will develop sufficient holding power. Where material thickness does not permit ample thread engagement, the answer is to use a greater quantity of small-diameter screws.

When a sufficient number of screw threads can be engaged, however, the lower limit of actual screw diameter is a function of screw strength—its ability to withstand the torsion stresses developed in driving it.

For Thicker Materials—In joining thicker materials, you may find it almost mandatory to use thread cutting screws rather than thread forming types. Use of the former will reduce the amount of torsion developed in the screw and keep the driving effort at a level that can be handled by production wrenching.

One fastener manufacturer notes "a very strong tendency toward the use of Type 23 (ASA Type T) thread-cutting screws as an almost universal type." It works well in virtually all materials, regardless of whether they are hard, ductile, soft, or friable.

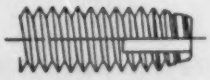
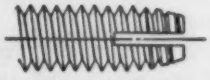
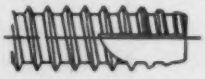
This screw type is produced in both the coarse- and fine-thread series. The same manufacturer recommends always using coarse threads with weak materials. Fine threads should be used only with thin materials where it is necessary to have two or more full threads of engagement above the top of the cutting slot.

Limit Head Styles—Standardizing on the fewest number of head styles in tapping screws (and machine screws, for that matter) is still another way to get more for your fastener dollar.

Design engineers and draftsmen do not always choose head styles in line with the function of a fastener or, indeed, with the particular type of wrench or driver used on the assembly line. If the interested parties will agree, it should be a simple matter to reduce your tapping screw and machine screw inventory to one style of round head and one style of countersunk head for virtually all assemblies.

Your standards engineer should be able to negotiate this agreement. Following this, he should put the pertinent information into your company manual of fastener standards.

Standard Thread Cutting Screws

TYPE	A S A	MANUF.	FEDERAL
	D	1	CS ALT. # 1
	F	F	CF
	F	F	CF
	G	G	CS ALT. # 2
	T	23	CG
	BF	FZ	BF
	BG	H	BG
	BT	25	BG

When to Use Special Types

If a standard fastener just won't do the job, the versatile heading process—hot or cold—can probably produce what you need at a surprisingly low cost.

▪ Where you just can't find a standard fastener to do a job, and you can't redesign an assembly to use a standard fastener, how do you solve the problem?

Do you set up to machine these special items out of bar stock?

Even though the cost per piece may seem all right, and the production rate is ample for your needs, one factor inevitably shrinks the fastener dollars you spend for machined "specials." It's the pile of chips you always wind up with, chips that cost you plenty but are literally useless to your operation.

Consider Heading — To avoid this waste, many companies are switching to cold- or hot-headed forms of special fasteners. High speed heading machines, used day in and day out to make millions of standard threaded fasteners, are well suited to the rapid production of special designs.

Cold heading, especially, may be the logical and economical answer to many of your special fastener problems. Because little or no metal is cut away in the process, you have virtually no scrap. Moreover, cold heading flows and compresses metal to give it added strength; fasteners made this way are better able to withstand service loads.

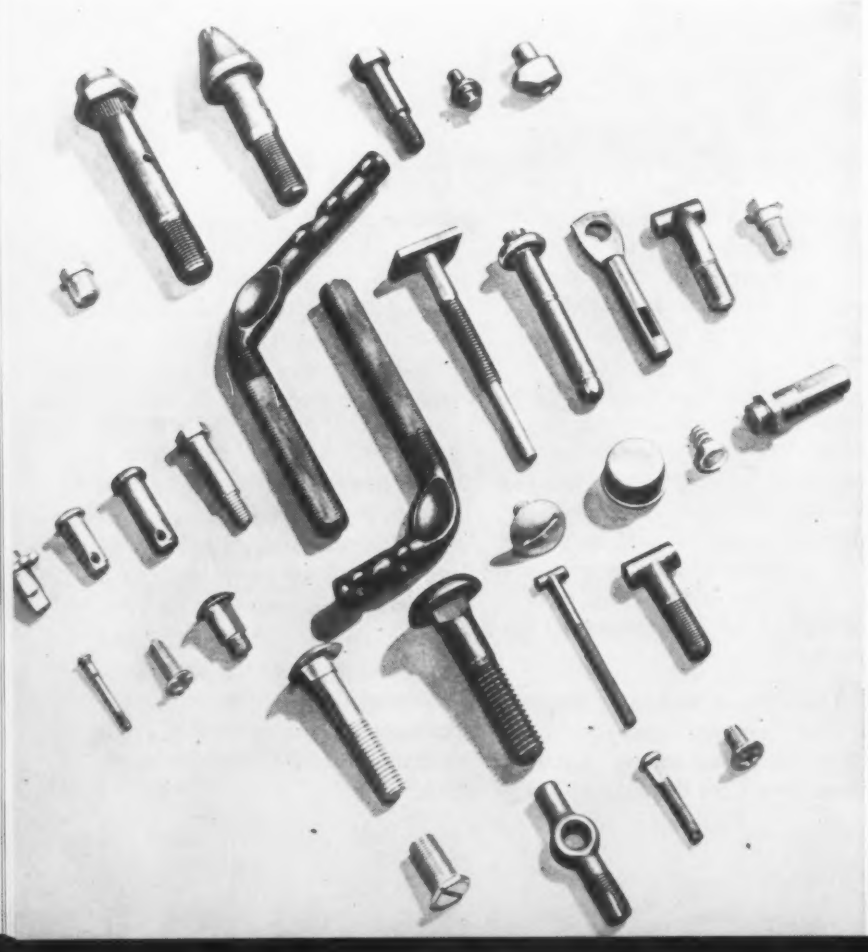
Reveals Unsound Metal — Cold heading has a built-in quality control feature, too. Because the process actually displaces metal, voids or unsound areas in the original blank will open up or distort somewhere along the line. Parts coming out of the heading machine are either good or they're rejects; there's no doubtful middle ground.

As the accompanying flow diagram shows, headed parts are formed from a solid, cylindrical blank. The blank is forged and cut off from a length of wire or rod as the first step in this high speed process. Various upsetting and forming operations then follow in quick sequence. The result: a steady flow of closely-dimensioned special fasteners with superior strength and attractive surface finishes.

The accompanying sketches and photos will give you a general idea of the special fastener shapes that can be produced on heading equipment. The case histories cited are all true, drawn from the files of member companies of the Industrial Fasteners Institute.

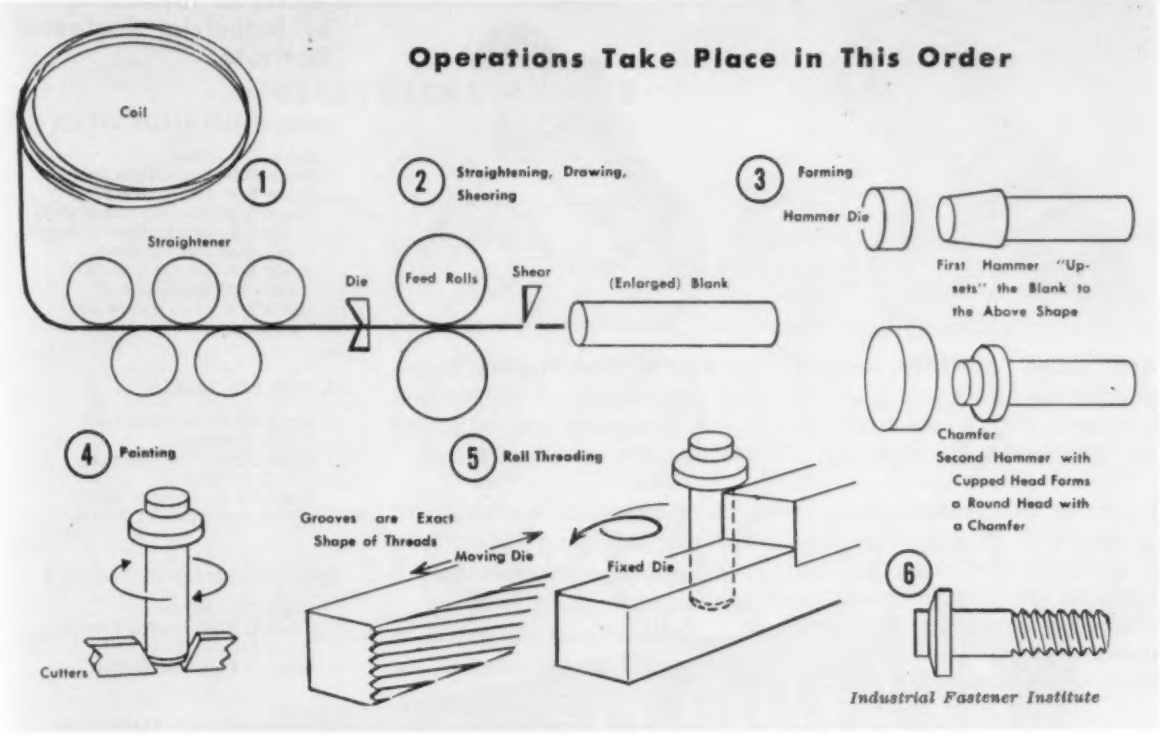
How Big?—In general, the maximum length of a cold headed fastener produced on a modern machine will be about six inches. Maximum diameter will depend on the shape of the piece and location of the upset portion. Most producers can cold-head wire and rod up to ¾ in. in diam, and some can handle slightly larger sizes. Some hot-heading machines will take rods up to 3 in. in diam.

As Fig. 1 shows, the practical limits of the length of stock, or vol-



ALL COLD HEADED: Range of parts made by Russell, Burdsall & Ward Bolt and Nut Co. shows the versatility of this technique.

How Typical Headed Fasteners Are Made



ume, which can be upset in a single or double-blow cold heading machine are 2¼ and 4½ diameters, respectively. However, with transfer headers — using double extrusions and three-blow headers or reheaders —volumes equivalent to 26 diameters have been successfully controlled and upset.

Economical Lot Size—The minimum number of cold headed parts in an economical production run depends on the part design and the cost of producing the same shape by alternate methods. Generally you can pay off the setup cost in one day's run. That's about 25,000 pieces for a fairly large part.

The field is wide open when it comes to the types of materials that can be cold headed. The Industrial Fasteners Institute offers a system of 20 material grades (see accompanying table) that cover practically any combination of end properties you might need in a special fastener.

You'll probably be money ahead if you don't specify the exact material, processing steps, and treat-

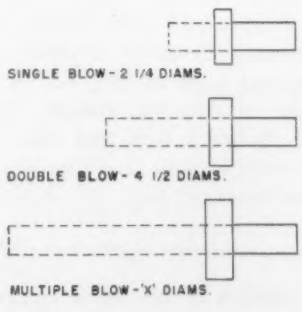
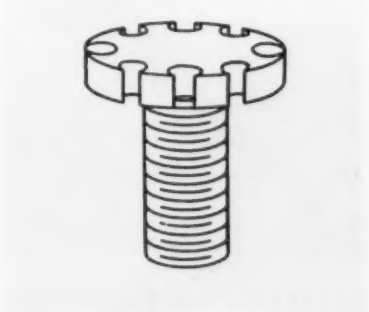
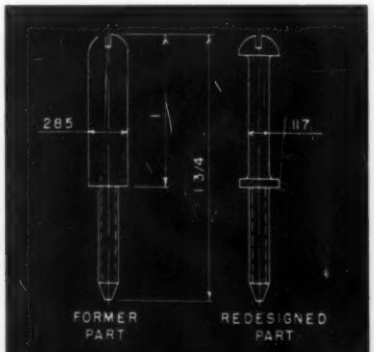


FIG. 1: Length of a heading blank that can be upset in single, double, or multiple-blow operations varies as a multiple of blank diameter.



ALUMINUM SCREW: Cost of drilling holes in the head prompted a redesign for cold heading, which saves the user $7 on every thousand.



DOUBLE-HEADED PART: By redesigning this mounting screw for cold-heading it as shown (right), savings amounted to 41 pct.

ADJUSTING SCREW: Former practice was to machine it and fit a stamping around the head. It's now cold headed in one piece.

INSERT SCREW: Heading, threading and knurling in one machine speeds production, cuts 40 pct off the former screw machine cost.

ments your cold heading supplier is to use. This is apt to limit his flexibility and increase your costs. Tell him what your fastener-service requirements are and let him be responsible for the choice of raw materials and manufacturing methods.

Design Tips—The cold-heading expert will give your design engineers a lot of help, too, if you'll let him. He knows, for example, that:

1. Concentric forms are easier to head than off-center or eccentric sections, although it is often possible to produce eccentric cams, serrations, and the like.

2. Sharp corners are hard to fill and that generous radii are best.

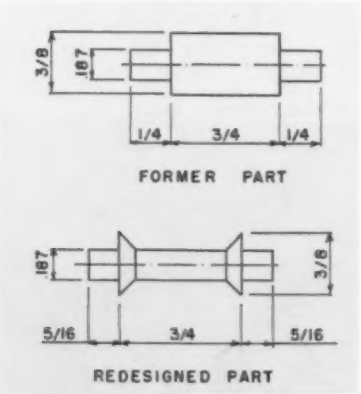
3. Oval or round shapes take less trimming than square forms.

4. Hollow upsets may result in cracking around the edges of the recess.

5. Lettering or embossing is expensive.

6. Long sections are more apt to distort if subsequent heat treatment is applied.

You'll get much more for your headed-fastener dollar if you let the supplier know exactly how you intend to use a given part and what performance you expect from it.



SHELVING SPACER: Cost of making the stainless spacer (top) on a screw machine led to cold heading. As cold formed (bottom), the savings on scrap alone amount to $4.50 per thousand.

LEVELING SCREW: Now made in a standard bolt making machine, this part was formerly made by the costly process of riveting a flat head to a set screw. Less expensive, the cold headed part is also stronger.

Material Grade System of Industrial Fasteners Institute

CARBON AND ALLOY STEELS

Grade S 0—Steel
Grade S 1—Low carbon steel
Grade S 2—Low carbon steel
Grade S 3—Medium carbon steel
Grade S 5—Medium carbon steel, quenched and tempered
Grade S 8—Low alloy steel, quenched and tempered
Grade S 10—Low carbon steel, annealed

STAINLESS STEELS

Grade SS 1—Stainless steel, 12% chromium
Grade SS 2—Stainless steel, 17% chromium
Grade SS 3—Stainless Steel, 18% chromium, 8% nickel

COPPER AND COPPER ALLOYS

Grade C 1—Copper
Grade C 2—Commercial bronze
Grade C 3—Heading brass
Grade C 4—Silicon bronze

ALUMINUM AND ALUMINUM ALLOYS

Grade A 1—Aluminum
Grade A 2—Aluminum, 17S
Grade A 3—Aluminum, 24S

NICKEL AND NICKEL ALLOYS

Grade N 1—Nickel
Grade N 2—Monel
Grade N 3—Inconel

Acknowledgments — The editors are grateful to many individuals and companies for helping make this feature possible. Special thanks go to Bell Telephone Labs.; The H. M. Harper Co.; John Hassall, Inc.; Industrial Fasteners Institute; The National Screw & Mfg. Co.; Radio Corp. of America; Russell, Burdsall & Ward Bolt and Nut Co.; Standard Pressed Steel Co.; Tinnerman Products, Inc.

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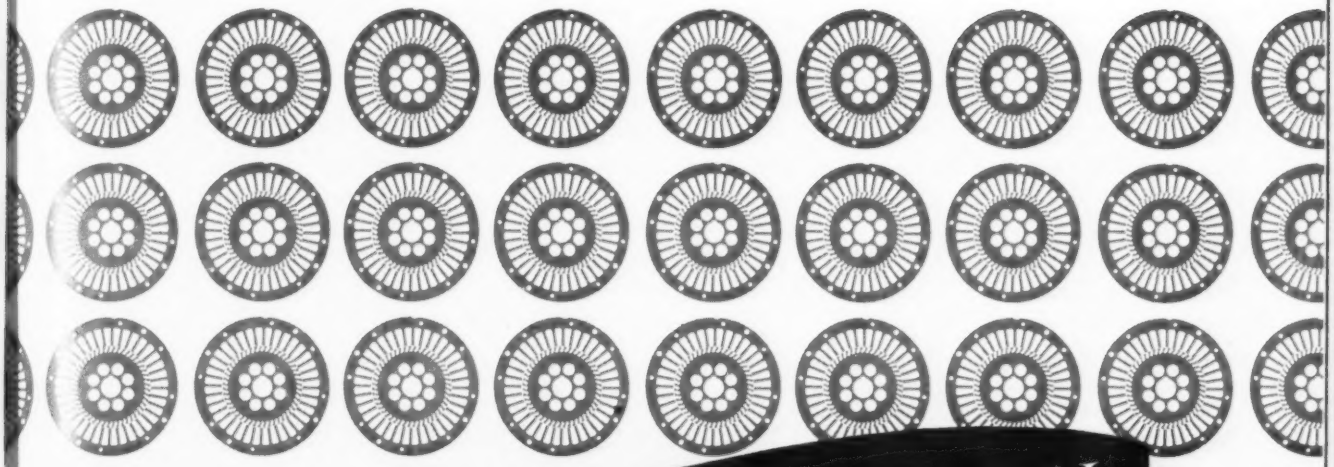
Acme-Newport

ELECTRICAL SHEETS



PUNCHABILITY

Electrical sheets from Acme-Newport consistently punch fast, clean and with extreme accuracy . . . because the steel itself is scientifically controlled through every stage of processing. This basic steel producer melts all silicon grades in modern electric furnaces, recognized for their superior quality. Rolling, annealing and finishing are equally exacting. The result is uniformity in electrical and magnetic properties, as well as in physical characteristics, ensuring dependable performance in motors, generators and other electrical products.

Acme-Newport offers technical skills and efficient facilities to meet your most demanding steel requirements. Our engineers will be glad to discuss your specific needs.

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

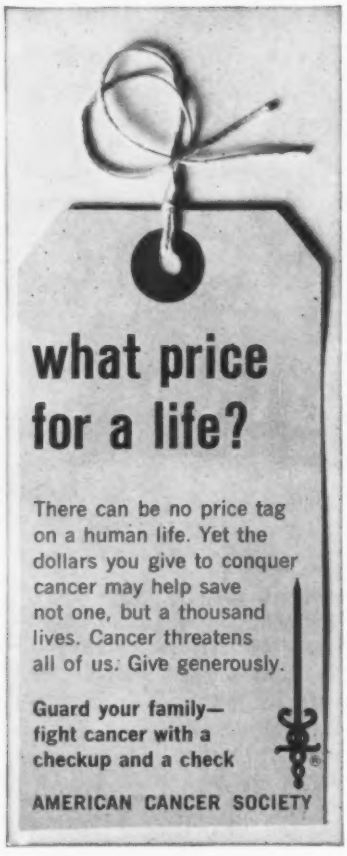
A SUBSIDIARY OF ACME STEEL COMPANY

PRODUCTS OF ACME-NEWPORT STEEL

Hot Rolled Steel in Coil • Hot Rolled Pickled Steel in Coil • Hot Rolled Sheets • Hot Rolled Pickled Sheets • Cold Rolled Steel in Coil (*full hard only*) • Cold Rolled Sheets • Alloy Sheets and Plates • Plates (5/16" *and lighter*) • Electrical Sheets • Electric Weld Line Pipe • Spiral Welded Pipe

New Catalogues and Bulletins

Money-saving products and services are described in the literature briefed here. For Your Copy just circle the number on the free postcard, p. 93.


what price for a life?
There can be no price tag on a human life. Yet the dollars you give to conquer cancer may help save not one, but a thousand lives. Cancer threatens all of us. Give generously.
Guard your family—fight cancer with a checkup and a check
AMERICAN CANCER SOCIETY

Plant Location

Authoritative and helpful, a new booklet explains the benefits of locating in Pennsylvania. It tells of plant location services for manufacturers, distributors, engineering firms and management consultants. Advantages of setting include: labor, markets, transportation, industrial sites, financing, production materials, minerals, water supplies, fuel, existing industry. (Pennsylvania Dept. of Commerce)

For more data circle No. 1 on postcard, p. 93

Storage Systems

Design and some applications of one make of storage rack are illustrated in a brochure. (Warehouse Storage Systems Co. Div. of Hatfield Industries, Inc.)

For more data circle No. 2 on postcard, p. 93

Ultrasonic Machining

A new service for the ultrasonic grinding and machining of hard, brittle, and "unmachinable" materials is offered. Non-thermal, non-electrical, and non-chemical, the process induces no changes in the properties of the machined material. It is described in a brochure. (Precision Glass Products Co.)

For more data circle No. 3 on postcard, p. 93

Flexible Metal Hose

Design, manufacture, and diverse applications of a line of flexible metal hose are illustrated in a 36-page brochure. (Pennsylvania Flexible Metallic Tubing Co., Inc.)

For more data circle No. 4 on postcard, p. 93

Rhodium Plating

A 20-page booklet tells when, where, and how to use rhodium electroplate and describes a special plating process. (Precious Metals Div., Sel-Rex Corp.)

For more data circle No. 5 on postcard, p. 93

Molded Piston Cups

A bulletin describes the latest types in a line of molded cups for pump pistons, hydraulic service, and pneumatic equipment. A section is devoted to conversion of pistons designed for hydraulic ring packings. (The Garlock Packing Co.)

For more data circle No. 6 on postcard, p. 93

Welding Equipment

Flux-cored electrodes and semi-automatic wire feed equipment are described in a bulletin, and operating instructions are provided. (Arcos Corp.)

For more data circle No. 7 on postcard, p. 93

Spring Alloy

A cobalt-nickel alloy originally developed for the high demands of watchsprings is offered to industry for wider applications in a 24-page brochure. Nonmagnetic and with great spring efficiency, it also has excellent corrosion-, fatigue-, set-,

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and temperature-resistance properties. (Elgin National Watch Co.)

For more data circle No. 8 on postcard, p. 93

Radiation Pyrometer

An improved radiation pyrometer is presented in a bulletin, along with technical information on the principles of radiation pyrometry. Four models cover a range from 500° to 3400°F. (The Pyrometer Instrument Co., Inc.)

For more data circle No. 9 on postcard, p. 93

New Lift-Truck Control

A new control system used on a line of lift trucks is explained in a four-page brochure. With a foot pedal combining forward-reverse shifting with the throttle, the driver's hands are freed for full-time steering and load control. (Hyster Co.)

For more data circle No. 10 on postcard, p. 93

End Mills

New design features give a series of end mills good performance and long tool life. They feature continuous, highly polished fluting and eccentric radial relief. The latter provides more rigidity for the cutting edge, and eliminates heel drag. (Pratt & Whitney Co., Inc.)

For more data circle No. 11 on postcard, p. 93

Limit Switches

Four heavy-duty side-plunger limit switches, available in both plug-in and permanent-mount housings, are described in a data sheet. They can "lie down" in cramped quarters, and actuator heads can be rotated to face in four directions. (MICRO SWITCH Div. of Minneapolis-Honeywell Regulator Co.)

For more data circle No. 12 on postcard, p. 93

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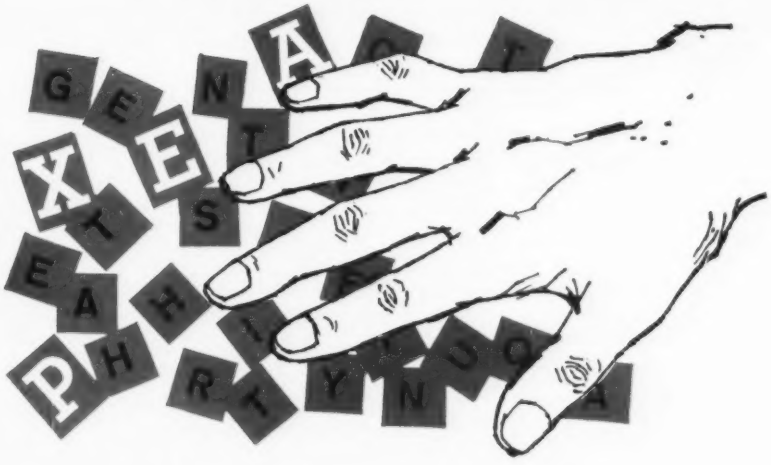

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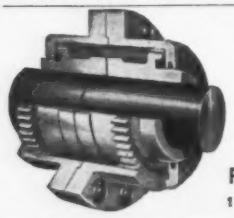

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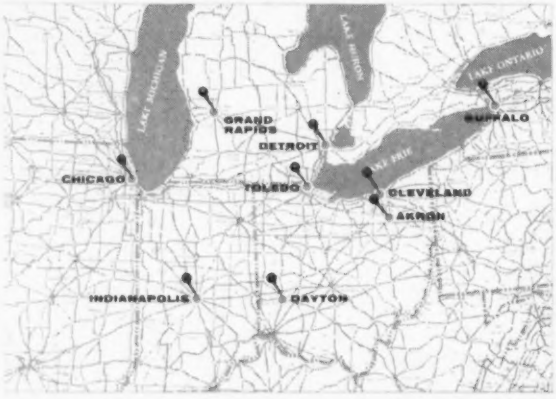

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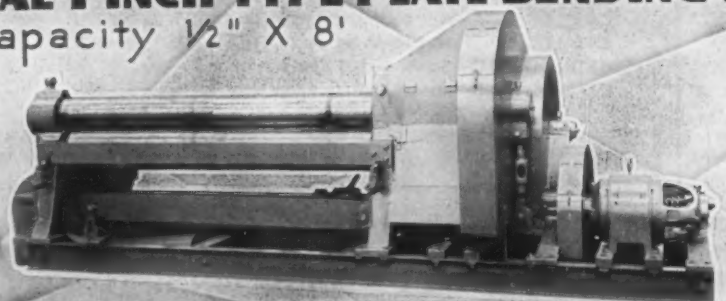

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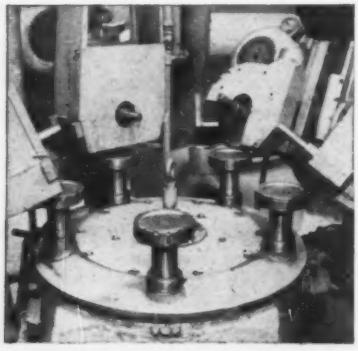

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FREE LITERATURE

supplies, is described in a 16-page catalog. (Consolidated Electrodynamics Corp.)
For more data circle No. 13 on postcard, p. 93

Blind Rivets

An eight-page brochure describes two series of blind rivets—pull-through (aluminum and steel), and self-plugging (steel only). Application instructions are included. (Huck Mfg. Co.)
For more data circle No. 14 on postcard, p. 93

PH 15-7 Mo Tubing

Small tubing drawn from PH 15-7 Mo, a precipitation-hardening stainless steel with outstanding mechanical properties at elevated temperatures, is described in an analysis sheet. (Superior Tube Co.)
For more data circle No. 15 on postcard, p. 93

Carriage Tracer

A two - dimensional carriage tracer for J & L turret lathes is described in a brochure. Hydraulically powered and mounted on the rear of the cross-slide, it controls cross-slide and carriage travel with a single stylus and flat template. (Jones & Lamson Machine Co.)
For more data circle No. 16 on postcard, p. 93

Studs and Nuts

A folder describes steel-alloy studs and high-carbon hex nuts for a variety of high-temperature, high-pressure uses. (Republic Steel)
For more data circle No. 17 on postcard, p. 93

Power Transmission

A line of power-transmission machinery is outlined in an eight-page bulletin. (Dodge Mfg. Corp.)
For more data circle No. 18 on postcard, p. 93

Wear Rectangles

Extruded aluminum bronze rectangles for severe wear and abrasion applications are described in a bulletin. (Ampco Metal, Inc.)
For more data circle No. 19 on postcard, p. 93

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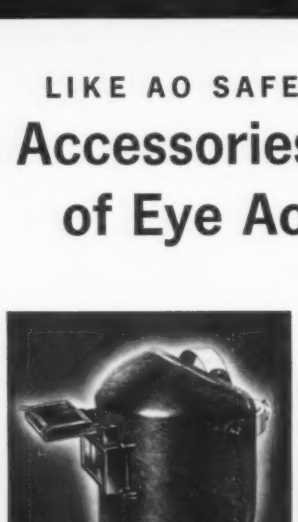

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Tape Control Products

A four-page brochure describes several products for tape control and data processing: photoelectric tape, mechanical control tape, and card stock. (The Dobeckman Co., A Div. of The Dow Chemical Co.)

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High-Temp Bolts

Aircraft bolts for working temperatures to 1600°F—among the highest-heat standard fasteners ever offered—are described in a four-page product bulletin. (Standard Pressed Steel Co.)

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Bench-Type Presses

An eight-page bulletin discusses typical uses for a line of bench-type 1- and 2-ton presses, and furnishes dimensional and construction data. Accessories are listed. (Denison Engineering Div., American Brake Shoe Co.)

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New Stainless Alloy

Properties of a new high-temperature stainless alloy for tubing, pipe, and welding fittings are presented in a data sheet. (Tubular Products Div., The Babcock & Wilcox Co.)

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Voltage Regulators

Application, description, selection, weights, dimensions, and connection diagrams are given in a new 60-page illustrated booklet describing a redesigned line of dry-type and liquid-filled voltage regulators. (General Electric Co.)

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Grind-Finish Wheels

A two-layer abrasive wheel eliminates tool-change time by doing both rough and finish grinding of weldments. It is described in a brochure. (Bay State Abrasive Products Co.)

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Stainless-Steel Wire

A 77-page book on cold-drawn stainless-steel wire describes the general qualities of a line of 27 types of stainless-steel wires. Full data are presented. (Uddeholm Co. of America)

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Hand Forgings

Alloys available and facilities to produce aluminum hand forgings are presented in a 20-page brochure. (Kaiser Aluminum & Chemical Sales, Inc.)

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Nickel-Clad Copper

Basic technical data on nickel-clad copper wire, and illustrations of some typical applications, are presented in a bulletin. (Riverside-Alloy Metal Div., H. K. Porter Co., Inc.)

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Moly Lube Suppliers

A pamphlet lists U. S. and Canadian suppliers of all types of lubricants containing Molysulfide. Forms marketed by each are specified. (Climax Molybdenum Co., Div. of American Metal Climax, Inc.)

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Adjustable-Speed Drive

Adjustable-speed and drive control problems are discussed in a new booklet. Typical applications are shown, along with methods and

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FREE LITERATURE

types of remote and automatic control. (The Cleveland Worm & Gear Co.)

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Nuclear Services

"Products for Nucleonics" describes a wide range of products and highly specialized services available to the nuclear industry from one company. (Engelhard Industries, Inc.)

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Grinding News

"Grits and Grinds" for May, 1959, presents a progress report on man-made diamonds and discusses how to correct centerless grinding faults. (Norton Co.)

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Torsion Testers

A complete line of torsion testing machines is described in a 10-page bulletin. The higher-torque machines have capacities from 60,000 to 1,000,000 in.-lb. Lower-torque models are also available. (Tinius Olsen Testing Machine Co.)

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Self-Threading Nuts

An eight-page bulletin gives data on a line of self-threading nuts for use on studs of any malleable materials, including zinc and aluminum die-cast, and on wire or rods of steel, etc. (The Palnut Co.)

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Roller Bearings

A 48-page engineering reference manual gives construction, dimensions, capacities, housing, and tolerance fits for a complete line of all types of roller bearings. (Orange Roller Bearing Co.)

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Narrow-Aisle Forklift

A heavy-duty electric forklift truck designed for narrow-aisle operations is illustrated and described in a four-page brochure. (The Raymond Corp.)

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Temperature Sensor

A helium-filled system for measuring temperature from 0° to 1200°F and transmitting pneumatically to indicating, recording, and/or controlling equipment at remote stations, is discussed in a bulletin. (Bailey Meter Co.)

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Architectural Stainless

"Architectural Stainless Engineering Data" is a six-page folder describing four stainless steel grades, with their properties, availabilities, and cost per sq ft. Application advice is included. (Washington Steel Corp.)

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Air Compressors

Two bulletins describe two different lines of air compressors. One covers air-cooled units in the 15- to 125-hp, 81- to 641-cfm range. The other includes heavy-duty, water-cooled industrial compressors in the 350- to 1250-hp, 2418- to 7392-cfm range. (Joy Mfg. Co.)

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Prealloyed Powders

A brochure lists types in a line of prealloyed metal powders. Homogeneity results. Tooling tips are included. (Vanadium-Alloys Steel Co.)

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"One-Shot" Lubricators

Semiautomatic lubricators that can service 100 or more bearings on a machine are described in a brochure. They are used on machines requiring closely controlled but infrequent oiling. Different models and applications are shown. (Bijur Lubricating Corp.)

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6. NEW PRODUCT IDEAS
7. TOOLING HANDBOOK
8. TOOL STEEL CHARTS
9. WELDING HANDBOOK
10. WELDING ROD & ELECTRODE CHARTS
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. . . the best from Iron Age, and only a small part of the mass of helpful suggestions and new ideas you will receive in a whole year (52 issues) of Iron Age itself. All available to you now for less than 10c a week . . . a piddling price that will be repaid many times over as you put these ideas to work saving time and money in your own operation.

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CHESTNUT & 56th STREETS

PHILADELPHIA 39, PA.

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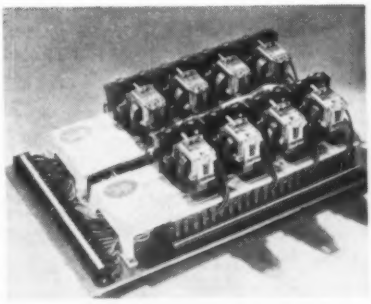
New Materials and Components

Uses Depth, Makes for Compact Control Panels

A wiring system designed to utilize depth behind relays in building control panels permits very compact mounting of relays and results in smaller panel enclosures. Units are of hinged aluminum modular construction with built-in wiring compartments. Relays are mounted on top and control wires underneath. Modules swing out so wires can be snapped in place behind vinyl retaining fingers. Each control mounting area is 14 x 5 in. These sections swing clear of the enclosure for fast inspection and repair. (Wyr-Way, Inc.)

For more data circle No. 43 on postcard, p. 93



Ferrochrome Dissolves Fast in Stainless

Made for low-carbon chromium additions to stainless steel during slag reduction or finishing, a new low-carbon ferrochrome dissolves faster. In one test, an addition of 6000 lb to a 70-ton stainless heat (3 pct chromium added) dissolved in 10 minutes during finishing at 2700°F. Carbon content is low—either 0.010 or 0.025 pct maximum. It generates little slag, and penetrates slag easily when added. It is available in both low- and high-silicon grades. Low in cost, it comes in either ⅓-lb pellets or 22-lb bricks. (Union Carbide Metals Co.)

For more data circle No. 44 on postcard, p. 93

Complete Line of Speed-Reduction Equipment

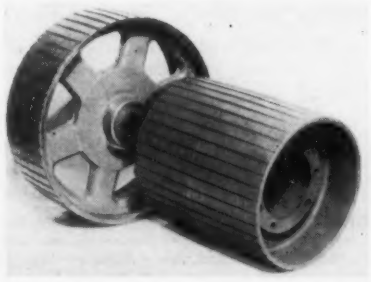
A line of enclosed gear drives is available to meet requirements for speed-reduction units 125 hp and smaller, with outputs from 780 to 1.2 rpm at 1750-rpm input. They meet all applicable AGMA standards. Hardened helical gears give high capacity, great shock resistance, and extra wear life. Heavy bearings provide high overhung load ratings. Various straight-line units are available as integral-type gearmotors, as all-motor-type gearmotors, and as separate speed-reducer units. The latter can also be furnished for right-angle drive. Shaft-mounted reducers are available to 40 hp. (Wagner Electric Corp.)

For more data circle No. 45 on postcard, p. 93

Tread Surface Improves Pulley Performance

Cross-grooves prevent entrapment of air between belt and pulley, and result in less slippage, longer belt life, and quieter operation without the use of belt dressings. These pulleys can replace original equipment in any flat-belt transmission, and are particularly adaptable to short center distances and where intermittent loads are encountered, as in hammermills, grinders, planers, etc. Sizes from 3½ to 16 in. in widths to 12 in. are available. (Republic Engineering Mfg. Co.)

For more data circle No. 46 on postcard, p. 93



No. 5 in a series of Hoerner corrugated shipping container experts

THIS IS THE HOERNER SPECIALIST FOR PACKAGING EXPENSIVE THINGS

The price of the packaged product doesn't faze Hoerner experts. They've found that very expensive things travel as safely as less costly items in properly designed corrugated boxes. If your product has above average value, let a Hoerner Packaging Engineer show you how safely – and economically – corrugated containers can protect and ship it. Call the nearest Hoerner office or plant.

HOERNER BOXES, INC.

Corrugated Specialists for Mid-America

GENERAL OFFICES— *600 Morgan St., Keokuk, Iowa* • **PLANTS**— *Keokuk, Des Moines and Ottumwa, Iowa Sand Springs, Oklahoma • Minneapolis, Minnesota • Fort Worth, Texas • Sioux Falls, South Dakota Fort Smith and Little Rock, Ark.* • *Affiliate—Cajas y Empaques Impermeables, S. A., Mexico City D.F., Mexico*

DESIGN DIGEST

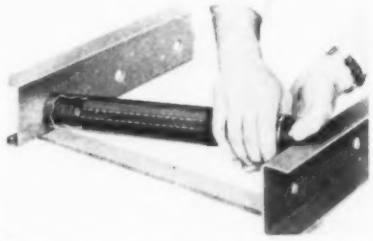
Titanium Alloy Tubing

A new titanium alloy approaching stainless steel in tensile strength is available in small seamless tubing form. It was designed to get the ductility needed for cold working. Corrosion resistance is good, and fatigue properties are excellent. (Superior Tube Co.)

For more data circle No. 47 on postcard, p. 93

Spring-Held Rollers

Spring-retained axles permit easy mounting and removal of rollers from frames in machines or conveyors. These rollers will be furnished in both plain-bearing and



dust-tight construction with all 7/16-in. hexagonal axles. The rollers come in diameters of 1⅞, 2¼, and 2½ in., with load capacity to 250 lb per roller. Straight and curved frames are also available. (The Alvey-Ferguson Co.)

For more data circle No. 48 on postcard, p. 93

Improved Vanadium

Substantially improved specifications for vanadium, reflecting drastic cuts in hydrogen, nitrogen, and carbon contents, are announced. Vanadium, with good strength at high temperatures, is being considered for tubing in atomic reactors. (Union Carbide Metals Co.)

For more data circle No. 49 on postcard, p. 93

Aluminum to Journals

Aluminum Company of America has been given permission to test-run aluminum bearings in railroad freight car journal boxes. The bearings will be made of a special aluminum-tin alloy. In tests to date,

aluminum bearings have withstood severe scuffing many hours longer than present low-cost bearing materials, and run 20° cooler. Success of these tests should lead to gradual changeover to these bearings, according to ALCOA. (Aluminum Co. of America)

For more data circle No. 50 on postcard, p. 93

Eddy-Current Damper

An eddy-current damper employs an electrically operated brake to permit locking a shaft to any desired position. Reliable, it is suited

to remote installation. It provides smooth, consistent control of undesirable forces such as overtravel, oscillation, surges, and unstable speeds. (Lyndon Aircraft, Inc.)

For more data circle No. 51 on postcard, p. 93

NEW BOOKS

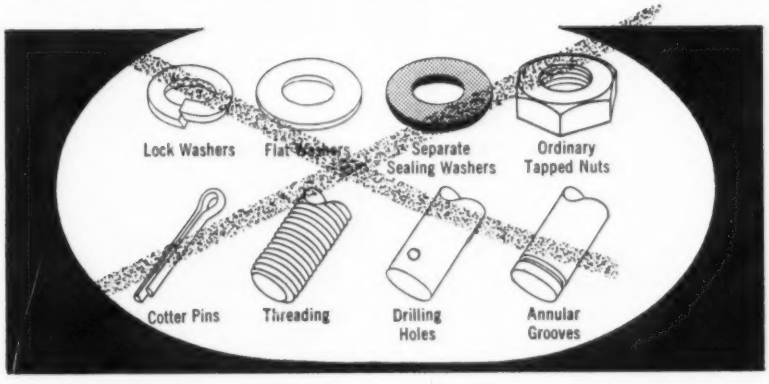
"Practical Ironmaking," by G. D. Elliott and J. A. Bond, deals with the theory of ironmaking and the operating principles of an ironworks. 276 pp. $6 per copy. Publications Dept., The United Steel Companies Ltd., 17 Westbourne Rd., Sheffield 10, England

"Automation and Society," edited by H. B. Jacobson and J. S. Roucek, traces the evolution of the concept and method of automation, and presents considered expert opinions on automation as an intellectual and social challenge. 553 pp. $10 per copy. Philosophical Library, Inc., 15 E. 40th St., New York 16

PALNUT® LOCK NUTS and FASTENERS

Eliminate

one or more of these assembly parts or operations



–and provide compact, vibration-proof assemblies

PALNUT Lock Nuts for Threaded members

Spring tempered steel Palnuts, with the dependable double-locking thread form, are available in many stock types and sizes to meet practically any assembly need. Here are typical advantages:

- **Low cost**—less than other locking devices, often less than plain nuts.
- **Easy, fast assembly** with ordinary manual or power tools, extra fast with Palnut Magnetic Wrenches.

- **Save Parts.** One Palnut replaces 2, 3, even 4 parts according to application.
- **Save Space** by eliminating auxiliary parts.

- **Save Weight**—up to 85% reductions in fastener weight.
- **May be removed and re-used.**

FASTENERS for Unthreaded Studs, Rods, Pins, etc.

SELF-THREADING NUTS

Save threading costs. Form their own deep, clean threads while tightening on studs of any malleable material, including aluminum or zinc die-cast; also rods, shafts, wire or pins of steel, aluminum, brass or plastic. Fast assembly with standard tools. Vibration-proof grip, whether seated or unseated. Remove and reuse on same studs. Sizes for ⅛", 5/32", 3/16" and ¼" dia. Write for Bulletin 585-A.

PUSHNUT® FASTENERS

Simply push on unthreaded studs, rod, wire or rivets. Strong spring grip resists removal. Save threading, grooving, drilling for cotter pins. Low in cost, fast assembly. Many types and sizes.

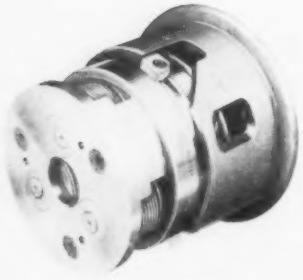
Write for Catalog 573-C and Free Samples, stating type, size and application.

THE PALNUT COMPANY, 63 Glen Road, Mountainside, N. J.
In Canada: P. L. Robertson Co., Ltd., Milton, Ont.

PALNUT® LOCK NUTS FASTENERS PAL®

Quick, secure fastening at low cost

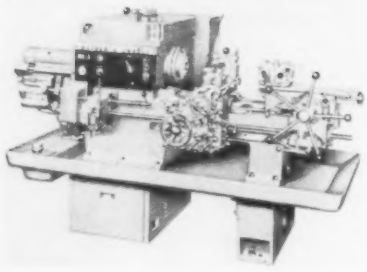
New Equipment and Machinery



Thread-Roller for Die-Head Type Machines

A thread-rolling head has a 7/16- to ⅞-in. UNF and UNC range, and is designed for use on automatic forming and threading machines and four-spindle semi-automatic threading machines of the same manufacture, which are supplied with die heads. In operation, the head opens in "pull-off" fashion. A cam shoe closes it as the spindle retracts. Replaceable helix angle bushings enable rolling precision threads; "mean" helix angle bushings handle ordinary jobs. (Landis Machine Co.)

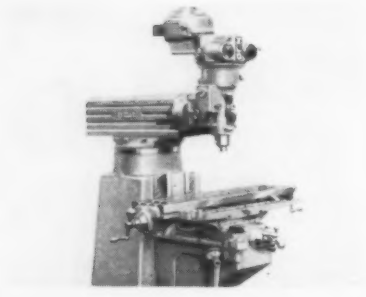
For more data circle No. 60 on postcard, p. 93



Hydraulic Headstock and Simple Speed Control

A new W & S No. 3 turret lathe features an eight-speed hydraulic-clutch headstock and single-lever speed preselection and change control. With a 10-hp motor, it has eight speeds from 90 to 2,262 rpm, with two-speed motor optional with speeds from 45 to 2,262 rpm. Headstock has a quiet, constant-mesh, helical gear train. A hydraulic chuck and bar feed mechanism is included, capable of handling work up to 1½-in. diam. The standard feeds are included. (The Warner & Swasey Co.)

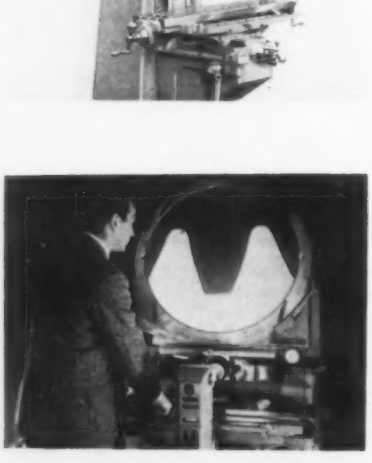
For more data circle No. 61 on postcard, p. 93



Dial Spindle Speeds on New Ram Turret Mill

A new milling machine has several money-saving features for both toolroom and production use. There's no belt-changing: spindle speeds are infinitely adjustable with a dial. The milling head pivots in planes both parallel to the work table and at right angles to it. Power spindle feed is standard equipment, with three speeds in both directions. A ram turret supports the milling head, and a manually operated pinion and rack provide lateral positioning of the head. (Ex-Cell-O Corp.)

For more data circle No. 62 on postcard, p. 93

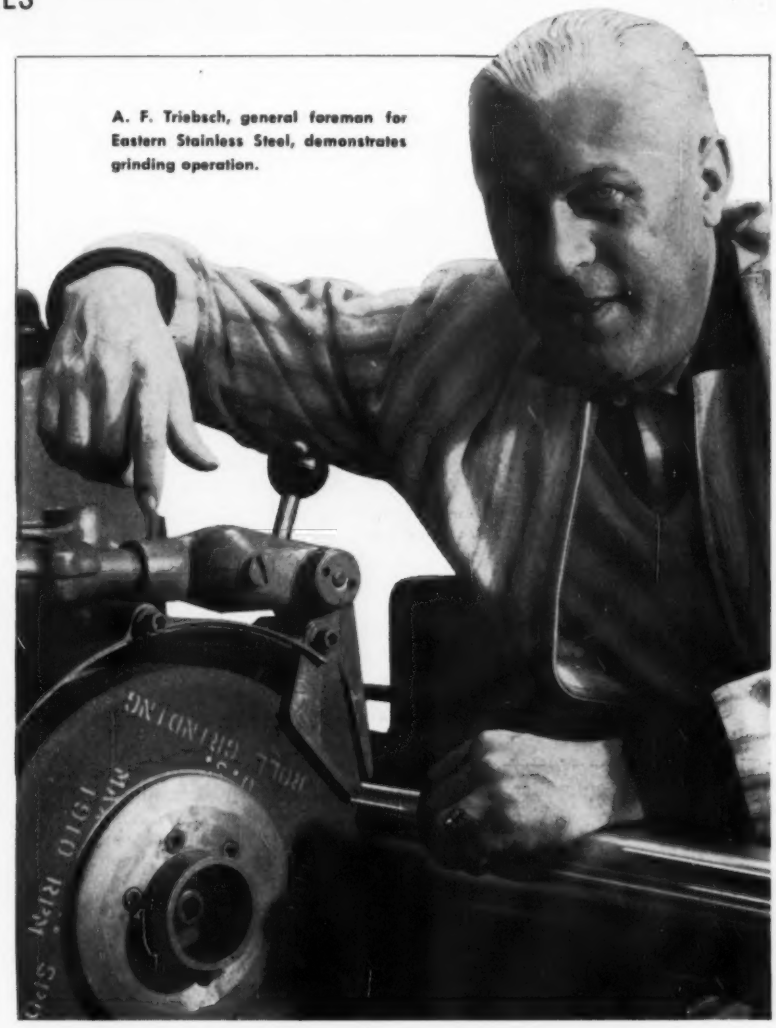


Bright Lamp Improves Precision Inspection

A mercury-arc-lamp light source unit has been designed for use with all J & L 14- and 30-in.-screen optical comparators. Providing more than five times the intensity of the best filament lamp, it produces an extremely bright, sharp shadow image even at highest levels of magnification, resulting in improved definition and more precise measurement. The small unit is self-cooling, and accommodates various standard makes of mercury-arc lamps. (Jones & Lamson Machine Co.)

For more data circle No. 63 on postcard, p. 93

US RUBBER GRINDING WHEELS



A. F. Triebsch, general foreman for Eastern Stainless Steel, demonstrates grinding operation.

Production UP 8%!

"U.S." Grinding Wheels help EASTERN STAINLESS STEEL achieve tolerances of 2/10 of .001" in precision work

In producing stainless steel of great precision, the steel passes through a succession of work rolls under a combined force of 59,000 pounds per square inch. All the rolls must be perfectly round and the tiniest defect must be eliminated. To produce a perfectly flat mirror finish, the rolls have to be 2/10ths of .001" perfect!

This is the kind of work Eastern Stainless Steel Corporation turns out every day. To keep their rolls in perfect balance and symmetry they use "U. S." Grinding Wheels. These amazing wheels allow for no "chatter" or vibration, consequently they never groove the roll. Prior to the use of "U. S." Grinding Wheels, at least an hour a day was lost when the operator had to readjust the machine.

Using "U. S." Wheels, Eastern Stainless Steel found many collateral advantages. Maintenance was reduced by more than 20%. "U. S." Grinding Wheels outlast conventional wheels at a ratio of 4 to 1, an obvious saving of 400%.

You, too, can effect important economies and achieve greater precision by turning your grinding wheel problems over to U. S. Rubber.

US RUBBER

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Tight spots, low clearance . . . no problem for highly maneuverable A-W 210 hydraulic crane . . . shown here speeding installation of new continuous wiredrawing machine in John A. Roebling's Sons mill, Roebling, N. J.

Versatility, maneuverability of A-W 210 cranes save time, labor in N. J. plant

"The outstanding performances of our Austin-Western hydraulic cranes and the many new uses to which they are constantly put continues to amaze us." That's what F. A. French, chief plant engineer at John A. Roebling's Sons, says about his company's two Austin-Western cranes.

Save many times cost

He adds, "The cranes have saved us many times their cost. One once did the work of a heavier electric crane which was out of commission for 3 weeks. Without the A-W the entire mill would have been down. I hardly know how we'd operate the plant without them anymore.

"A month doesn't go by without someone saying, 'You ought to see what we're doing with the A-W now!' The cranes are tremendous time and labor savers. Their maneuverability is amazing. There doesn't seem to be any place our operators can't take the A-W's with all-wheel steering.

"They are such useful pieces of equipment that they're kept busy on all three shifts and yet they require only normal maintenance."

3 models now available

Austin-Western hydraulic cranes are available now in three models: the 210 basic self-propelled rubber tired unit with 18-ft. telescoping boom which rotates in a full circle; the 210-P for truck and stationary mounting; and the model 220 with counterweighted boom for greater lifting capacity. Choice of gas or diesel power. A wide range of optional equipment offers added versatility. Learn how you can save time and labor for greater profit with A-W hydraulic cranes. See them at your nearest A-W distributor's or write us today for full information.

Plant cleanup is no problem with an A-W sweeper on the job. Available in two sizes—2-yd. Model 40 and 4-plus-yd. Model 60.

Austin 1859 AUSTIN-WESTERN 1959 100th YEAR PARTNERS IN PROGRESS Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

BALDWIN BLH LIMA-HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

NEW EQUIPMENT

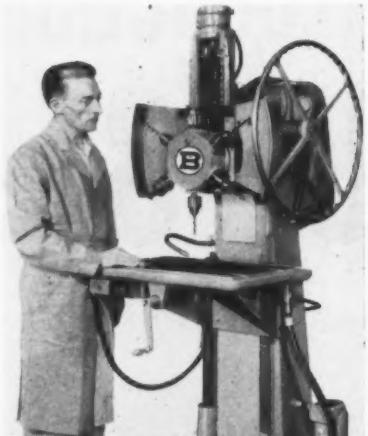
Barrel Finisher

A portable deburring and finishing barrel is ideal for those with limited finishing needs, or for processing small lots of parts. The barrel is 12 in. in diam by 8 in. wide, with a ½-cu ft capacity. It can be driven from 19 to 38 rpm. (Almco, Queen Products Div., King-Seeley Corp.)

For more data circle No. 64 on postcard, p. 93

Improved Turret Drill

Improvements are announced to Model 1C of a line of turret drilling, boring, and tapping machines. This model has a ⅜-in.-diam drill capacity in steel. Now included are a heavier, simpler transmission and



clutch assembly, and a counterweight for the head which can be set either to counterbalance or to return the slide to the top of the stroke. This machine has 7-in. spindle travel and a maximum clearance of 28 in. (Burg Tool Mfg. Co.)

For more data circle No. 65 on postcard, p. 93

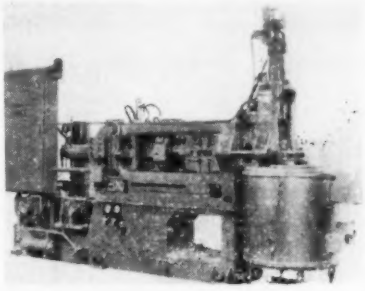
Improved Spectrometer

A model in a line of direct-reading spectrometers has been re-engineered to allow a greater number of elements to be analyzed at once Composition of metal samples can be determined in less than one minute, with results presented in per

cent concentration on indicator dials. No special laboratory is required, permitting installation close to working areas, and fast reporting of results (Baird-Atomic, Inc.)
For more data circle No. 66 on postcard, p. 93

Automatic Die-Caster

A new automatic machine will cast up to 6¾ lb of zinc, and provides over 1,000 free cycles per hour. The 18 x 21-in. platens accommodate dies up to 16 in. high



requiring a 9-in. opening. It has 125 tons of clamp force. It is operated with a 25-hp motor and a 2750-cu in. accumulator. (Lester-Phoenix, Inc.)
For more data circle No. 67 on postcard, p. 93

Nonmagnetic Tester

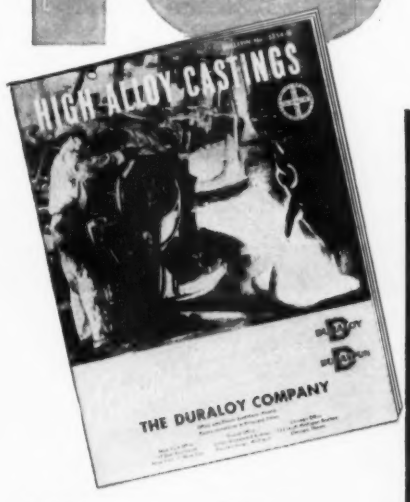
Nondestructive testing using eddy currents to measure and sort nonmagnetic metals is available in a battery-powered instrument. After calibration against standard samples, the tester can provide immediate conductivity readings from 8 to 107 pct I.A.C.S. for practically all nonmagnetic metals. It can determine hardness, alloy, and heat-treat condition. (Magnaflux Corp.)
For more data circle No. 68 on postcard, p. 93

NEW FILM

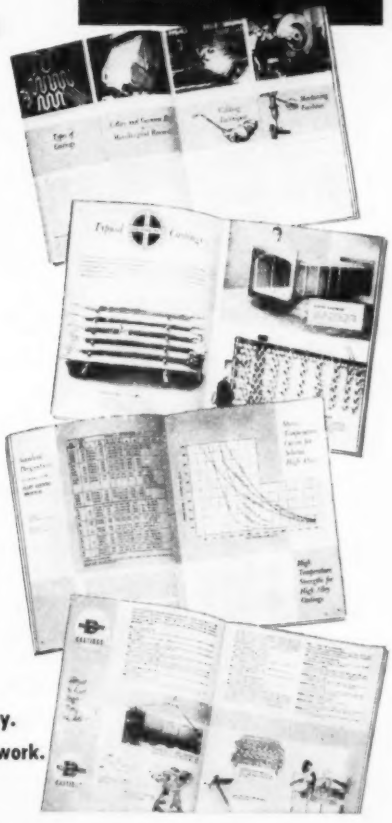
"Engineered Screw Machine Tooling Applications" features eight practical applications of latest design automatic screw machines, with explanations of the tool engineering involved. 35 min. 16mm, color, sound. Brown & Sharpe Mfg. Co., Machine Tool Div., Providence 1, R. I.

16 pages of useful information about

HIGH ALLOY CASTINGS



DURALOY DURASPUN



This is our New General Bulletin—3354G. It's full of information and data on the chrome-iron and chrome-nickel castings so necessary when corrosion, high temperatures and abrasion must be resisted. It will serve as a general selection guide for those specifying or using such castings.

The bulletin also reviews briefly our experience in both static and centrifugal castings, an experience going back to the pioneering days of 1922 and 1933 respectively. It also tells about our facilities for furnishing castings to any desired analysis, welding, X-ray and gamma ray testing, metallurgical and foundry control.

WRITE or CALL our nearest office for a copy.
We believe you will find it helpful in your work.

The DURALOY Company
OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
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DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

Inland "job-tailored"
Cold Rolled Sheets work better

product: VACUUM CLEANER TANK PART

problem:

produce a handsome vacuum cleaner tank of the upright type, designed in a silhouette for consumer eye appeal. The operation to be a single deep draw. Because of the depth of the draw and the severe shaping, a sizeable amount of breakage could result. The required draw also produced stretcher strains in the shaped tank which handicapped later finishing operations.

solution:

quality standards were met and the problem overcome by "job-tailored" Inland Cold Rolled, Drawing Quality, Aluminum Killed Steel. This steel, specifically recommended for the job, successfully took the deep draw and pattern formation required. Stretcher strains were eliminated and an excellent surface obtained for all subsequent finishing.

INLAND STEEL

30 West Monroe Street, Chicago 3, Illinois

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INLAND

Cold Rolled Sheets

The Iron Age Summary

Mills Fret Over Third Quarter

July business is expected to be good, barring a strike at mid-month.

But steel salesmen worry about customer attitudes in August and September should there be no shutdown.

■ Steel mills are not kidding themselves about the third quarter business outlook.

Barring a strike after the two-week contract extension expires, (see page 41) they're certain that July business will be good. But August and September are big question marks should steel management and labor settle their differences without a walkout.

What Mills Fear—It's not that they expect wholesale cancellations. What they're afraid of is that their customers will let the orders stand, but ask for deferments from month-to-month. This sort of thing would result in a significant letdown in late third quarter business.

"And it will be some of the same customers who are screaming for delivery now," worries one steel sales manager.

Tight Products—The word from most major steel centers is that for July and August the mills have capacity or near-capacity bookings on cold-rolled, hot-rolled, galvanized and long-terne sheets; on hot-rolled bars in small sizes, on carbon plates, and wide-flange beams.

Wildcat strikes at some plants threw the mills affected off balance. The walkouts built up the carryovers at these plants. For the customers involved, the contract extension was a God-send. It provided a much-needed "breather" also for those steel users who had not been able to build their inventories to what they consider a safe margin.

August Key Month—If there is no strike, the critical third-quarter month probably will be August. If the mills are forced to cut back sharply on output, the psychological effect could be important. It could start a wave of inventory cutting by those users least able to support a heavy investment in stocks.

On the other hand, many steel makers are hoping the demonstrated strength of the economy to date will carry through the balance of the year and thus sustain a respectable operating rate, on the average.

Yearly Forecast—Market observers still look for production of about 115 million ingot tons for the year. They say there is even a chance that output will equal or exceed the 117 million tons turned out in 1955, the record year.

When the final figures are in, production for the first six months is expected to total more than 64 million tons. To reach 115 million tons for the year, output in the last half would have to total only 51 million tons, which would represent an operating rate of about 70 pct on the basis of annual capacity of 147.6 million ingot tons.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,392	2,491	2,661	1,376
Ingot Index				
(1947-1949=100)	148.9	155.1	165.7	85.7
Operating Rates				
Chicago	90.0	93.0*	94.0	64.0
Pittsburgh	81.0	82.0*	96.0	51.0
Philadelphia	86.0	86.0*	96.0	53.0
Valley	78.0	82.0*	90.0	31.0
West	90.0	93.0*	94.5	60.0
Cleveland	71.0	91.0*	94.0	25.0
Detroit	67.0	95.0*	96.0	51.0
Buffalo	105.0	105.0	107.0	41.5
South Ohio River	88.0	91.0*	92.0	66.0
South	82.0	92.0	97.0	60.5
Upper Ohio River	86.0	88.0*	91.0	70.0
St. Louis	90.0	89.0	91.0	78.5
Aggregate	84.5	88.0	94.0	51.0

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	$66.41	$66.41	$66.41	$66.49
Scrap No. 1 hvy (Gross ton)	$38.50	$38.17	$37.17	$35.17
No. 2 bundles	$26.33	$25.50	$25.17	$25.83
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.10
Copper, electrolytic	31.50	31.50	31.50	25-26.50
Lead, St. Louis	11.80	11.80	11.80	11.30
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	103.375	103.625	104.00	94.50
Zinc, E. St. Louis	11.00	11.00	11.00	10.00

Support Farsighted Suppliers

Mark W. Cresap, Westinghouse president, says don't judge suppliers on price alone.

Help those who contribute to progress in their field, he adds, and you share their research and development work.

■ Buy from the companies that "advance the art" in their field, even if it costs a few cents more, says Mark W. Cresap, Jr., president of Westinghouse Electric Co.

He told a group of purchasing men at New York recently they would be making a grave mistake to make these companies compete on the same price level with suppliers who have little in the way of engineering resources, do little or no research work, and seldom improve their products except when they borrow and adapt innovations introduced by their competitors.

"We know that to place these companies on an equal price level will ultimately weaken the creative abilities of those which are foresightedly assuming substantial research and development costs," says the Westinghouse president.

Consider Your Aims — If you have difficulty justifying the higher cost item on the basis of the overall good in supporting the "artists of industry" consider this Cresap approach:

"It is the objective of your company to stay well ahead of its competition in the development of new and better products. In this objective why shouldn't you look upon your supplier as a natural partner? Why shouldn't you use him as a member of a team to reduce costs and improve your current products?

MARK W. CRESAP: He favors companies that advance the art.

"Why shouldn't he contribute through a long-range team development program to the solution of design problems for new products now being developed?"

Get Your Share — Here is Cresap's clincher on behalf of progressive suppliers:

"The experts tell us that this country will spend twice as many billions of dollars on research and development in the 1960's as we spent in the 1950's. Your suppliers will be spending a considerable share of that money. It is to your interest to see that some of it is spent in your behalf."

Here's an indication that Mr. Cresap takes what he says very seriously: Westinghouse will spend $190 million in 1959 for research and development. This will cover the work of 7000 scientists and engineers doing research and development work—slightly over six pct of the entire Westinghouse payroll.

Economic Pressures—Mr. Cresap believes our economy will come under great pressure from three major sources in the years right ahead: (1) sharp increase in our population; (2) our insistence on a rising standard of living; and (3) the rising tide of technology.

"But," he says, "If we carry out such a massive technical effort in the 1960's, if we do manage our affairs with reasonable competence, if we are allowed to work and rear our children in peace, there is virtually no limit to what Americans can accomplish in the remaining years of this century.

"We can build a magnificent industrial machine on the human values which make the industrial machine worth running."

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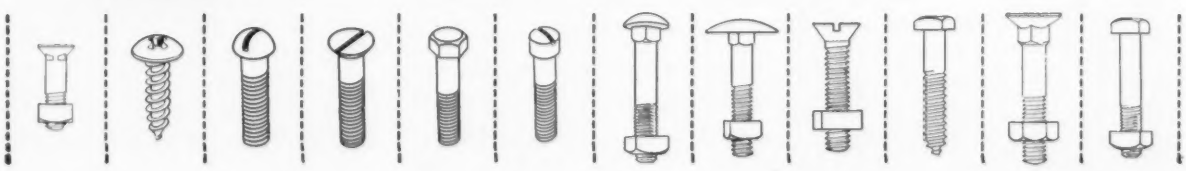

Carryover Problems Not Yet Solved

Last-minute word the mills will operate at least through mid-July was welcomed by steel users.

Extra time will allow mills to get out delayed June orders, but in some cases it will also push back July tonnages.

▪ Steel users fretting about June deliveries got a last-minute reprieve. Extension of labor contracts with the USW until mid-July gives mills an extra two weeks to clean up June backlogs.

But it does little to solve the problem of third quarter carryovers. And it leaves the scrambled delivery situation as confused as ever.

With the work extension, July tonnages will wait until all June orders are filled. Should a strike come they will then get priority after a settlement.

But even without a strike, the carryovers are going to muddle the delivery picture. Midwest plate mills, for instance, say absence of a strike won't help the supply situation.

Producers there are booked through the third quarter. The average carryover on unfilled orders is six weeks. And user inventories, in some cases, are lower than a 30-day supply.

Much of the same situation exists in sheet products. Farther east the situation is less acute. But even at Pittsburgh and East Coast mills plate and sheet backlogs amount to several weeks in many cases.

Sheet and Strip—Mill prospects of shipping all June sheet tonnage improved with extension of steel labor contracts to mid-July. Until this agreement the outlook of some sheet users on getting June deliveries was bleak. Mill carryovers on sheet range from about 2 weeks on the **East Coast** to 4 weeks or more at **Chicago.** Now mills have a good chance to clean up sheet backlogs. And July schedules will be delayed even if there's no strike.

Meanwhile, most mill books for August are just about filled on cold-rolled, hot-rolled, galvanized, and long terne sheet. Electrical steel orders, however, are off slightly from the boom levels of the first six months.

Pittsburgh producers say all steel now being ordered by the automakers is for 1960 model cars. So far introduction of the small cars is having little effect on the amount of steel being bought. It's estimated about 20 pct of 1960 auto production will be in small cars. These will take about 15 pct less steel than conventional models.

Plate — Most plate producers have full order books for July with August orders now coming in. **Pittsburgh** mills say August schedules are now about 50 pct filled. When all expected tonnage is requested they estimate books will be 75 pct full.

Order position of **East Coast** mills varies depending on the producer involved. Some mills are sold out for July and August. Several are fully booked for July, and filling in August orders. One mill is still interested in booking July tonnages. Two **Eastern** plate producers have union contracts running through the end of July.

Pipe and Tubing — The third quarter outlook remains dismal for mills making oil country seamless. Many oil producers took a large portion of their requirements during the first half of '59. Even at that the inventory buildup was not excessive.

Steel Service Centers—The rapid growth in mill carryovers during recent weeks has depleted warehouse stocks of steel faster than expected.

Chicago area distributors say the toughest items to get include sheet (all types), hot-rolled bar, alloy bar, plate and structurals. Warehouse officials there confirm that bar stocks are now not more than a two months' supply, considered about half of normal. Alloy bars in the 2 in. to 4 in. range, for example, are in very scarce supply.

More service centers have switched to the net pricing method for sheets, strip, plate, shapes, and hot-rolled bar. Warehouses in at least nine cities now use the net pricing system. Latest additions are Detroit, Cincinnati, and St. Louis. (Service center prices are on p. 119.)

McLouth Expands — McLouth Steel Corp. has announced an $11 million expansion program for its Trenton, Mich. plant. Construction work will begin immediately. Scheduled date for initial operation of the new facilities: June 1960. Included in the expansion will be additional sinter plant facilities, more oxygen steelmaking capacity, and auxiliary equipment.

PURCHASING AGENT'S CHECKLIST

Industrial price boosts expected as cost pressures mount—an IRON AGE Special Report. P. 37

Growing trend toward in-plant food service for workers. P. 45

How to get more for your fastener dollar. Starts on p. 68

COMPARISON OF PRICES

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	June 30 1959	June 23 1959	June 2 1959	June 30 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	46.75	46.75	46.75	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloys blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

(Effective June 30, 1959)

	June 30 1959	June 23 1959	June 2 1959	June 30 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.97
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.47
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.49
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$43.50	$42.50	$41.50	$37.50
No. 1 steel, Phila. area	37.50	37.50	35.50	33.50
No. 1 steel, Chicago	34.50	34.50	34.50	34.50
No. 1 bundles, Detroit	36.50	35.50	35.50	31.50
Low phos., Youngstown	43.50	42.50	41.50	38.50
No. 1 mach'y cast, Pittsburgh	51.50	50.50	49.50	48.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	47.50
No. 1 mach'y cast, Chicago	58.50	58.50	57.50	45.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$38.50	$38.17	$37.17	$35.17
No. 2 bundles	26.33	25.50	25.17	25.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50-15.50	$14.50-15.50	$14.50-15.50	$15.38
Foundry coke, prompt	18.50	18.50	18.50	17.50-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	31.50	31.50	31.50	25-26.50
Copper, Lake, Conn.	31.50	31.50	31.50	25.00
Tin, Straits, N. Y.	*103.375*†	103.625	104.00	94.50
Zinc, East St. Louis	11.00	11.00	11.00	10.00
Lead, St. Louis	11.80	11.80	11.80	11.30
Aluminum, virgin ingot	26.80	26.80	26.80	26.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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INDEX TO PRICE PAGES

Prices at a Glance 105
Comparison of Prices 109
Bars 116
Billets, Blooms and Slabs 114
Boiler Tubes 118
Bolts, Nuts, Rivets, Screws 118
Clad Steel 118
Coke 118
Electrical Sheets 118
Electrodes 118
Electroplating Supplies 119
Iron Ore 119
Merchant Wire Products 118
Metal Powders 119
Nonferrous
- Mill Products 113
- Primary Prices 109-112-113
- Remelted Metals 113
- Scrap 113

Piling 114
Pig Iron 120
Pipe and Tubing 117
Plates 116
Rails 118
Refractories 118
Service Center Prices 119
Shapes 114
Sheets 115
Spring Steel 118
Stainless 120
Steel Scrap 111
Strip 114
Structurals 114
Tinplate 115
Tool Steel 118
Track Supplies 118
Water Pipe Index 119
Wire 116
Wire Rod 115

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CHATTANOOGA 2, TENN.

Confusion Reigns But Prices Hold

The steel labor contract extension caught some buyers by surprise.

Some have ordered scrap for quick delivery. Others are watching and waiting.

▪ The market is confused but strong.

The unexpected two-week extension of the steel labor contract caught some mills short of scrap. They sought quick delivery of material, mostly from the industrial lists. In most cases, the mills paid higher prices.

Many more mills re-opened delivery from a week to 10 days on old orders. Others, preparing for vacation shutdowns this month, took in no additional scrap.

Scrap stocks vary from mill to mill but the contract extension has shown up the low inventory position of some buyers. This condition is general enough to assure a strong market no matter what happens to the steel labor talks.

A continued high rate of export activity is further reason to expect that the scrap market will remain strong for weeks to come.

Based on a $1 rise in Pittsburgh, The IRON AGE No. 1 heavy melting Composite Price is up 33¢ to $38.50.

Pittsburgh—Strength was shown by industrial lists, which jumped $2 to $3 from last month. In line with this movement, there were price advances for No. 1 factory bundles, No. 1 dealer openhearth grades, No. 1 railroad heavy melting, and low phos. All grades are strong, but it is too soon to measure the full effect of labor developments.

Chicago — Dealer asking prices advanced and the market dried up on news of the steel contract extension. Cast and electric furnace continue strong. Attempts by mills to make new purchases at existing prices brought in only small tonnages of scrap.

Philadelphia — Mills have released shipment on orders for another week to 10 days, but there have been no new sales. Prices remain firm. Export has cleaned a lot of material out of the city. More cargoes will be loaded this month. Electric furnace bundles were incorrectly quoted last week. Correct price was $39.00 to $40.00.

New York—The market is quiet. Extension of the steel labor contract has had little effect here. Prices are unchanged.

Detroit—Widespread interest in Detroit's industrial lists was noted as No. 1 industrial bundles closed with an average price of $43 delivered to the mill. This is up $2 from a month ago. Dealers are flooding brokers with calls to see if mills have indicated they'll buy scrap during the labor truce. So far, no definite answer.

Cleveland — Mills taking scrap extended shipments 10 days generally following labor contract extension. A few mills were caught short and want quick delivery. About 22,000 tons of auto bundles went for $42 to $42.50 on cars, up about $1.50 from the previous month. Production scrap will be stored in event of strike but dealer market is still slow.

St. Louis—The steel labor situation has cast a cloud of uncertainty over the scrap market. Dealer shipments are small and mills are holding most prices at current levels. Machine shop turnings, shovelings, and some railroad grades are up 50¢ to $1.

Birmingham—Cast scrap buyers who held the price line for several months in the face of scarcity of supply, this week raised prices as much as $2 a ton. Other items remain unchanged. Buying is light. The No. 1 dealer bundle price of $36 to $37 in the issues of June 18 and June 25 was in error. The price should have been $32.50 to $33.50. A new item, No. 1 special bundles, is being added to the list. The price for this is $36.00 to $37.00.

Cincinnati—Auto lists went for slightly over $40 on cars and are expected to stay in the area this month. Dealers are still holding back on sales at current prices and mills aren't reaching for scrap. Foundries have started to pick up.

Buffalo—The market is marking time. Strength is apparent but there has been no activity and prices are unchanged.

Boston—Everything is up in the air. Steelmaking scrap prices are holding steady, but the labor situation has dealers and brokers perplexed. Shoveling turnings are up 50¢ to $13, and No. 1 machinery cast is up $2 to $36.

West Coast — Exporting is the only scrap activity in the district. Heavy export buying has raised prices for top steelmaking grades $1 to $2 in Los Angeles and San Francisco.

Houston — The market is firm although the district mill is out of the market and likely will be for some time because of high scrap inventories. One exporter is having trouble meeting commitments.

SCRAP PRICES *(Effective June 30, 1959)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	43.00 to 44.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs plate	47.00 to 48.00
Heavy turnings	33.00 to 34.00
No. 1 RR hvy. melting	44.00 to 45.00
Scrap rails, random lgth.	51.00 to 52.00
Rails 2 ft and under	56.00 to 57.00
RR specialties	50.00 to 51.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	43.00 to 44.00
Stainless	
18-8 bundles and solids	230.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	41.50 to 42.50
No. 2 bundles	24.00 to 25.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Low phos. forge crops	49.00 to 50.00
Low phos. punch'gs plate, ¾ in. and heavier	46.00 to 47.00
Low phos. 2 ft and under	44.00 to 45.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	49.00 to 50.00
Rerolling rails	59.00 to 60.00
Rails 2 ft and under	54.00 to 55.00
Angles and splice bars	50.00 to 51.00
RR steel car axles	65.00 to 66.00
RR couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	58.00 to 59.00
Cupola cast.	51.00 to 52.00
Cast iron wheels	43.00 to 44.00
Malleable	59.00 to 60.00
Stove plate	49.00 to 50.00
Steel car wheels	48.00 to 49.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	115.00 to 120.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 28.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	19.00 to 20.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	23.00 to 24.00
Clean cast. chem. borings	24.00 to 25.00
Low phos. 5 ft and under	39.00 to 40.00
Low phos. 2 ft punch'gs	41.00 to 42.00
Elec. furnace bundles	39.00 to 40.00
Heavy turnings	33.00 to 34.00
RR specialties	43.00 to 44.00
Rails 18 in. and under	59.00 to 60.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	42.00 to 43.00
Cast iron car wheels	45.00 to 46.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.50 to $34.50
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	33.50 to 34.50
No. 2 bundles	23.00 to 24.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	18.00 to 19.00
Low phos. 18 in. and under	43.00 to 44.00
Rails, random length	47.00 to 48.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	45.00 to 46.00
Hvy. breakable cast.	41.00 to 42.00
Drop broken cast.	51.00 to 52.00

Youngstown

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	28.50 to 29.50
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	27.50 to 28.50
Machine shop turn.	18.50 to 19.50
Shoveling turnings	23.50 to 24.50
Low phos. plate	43.00 to 44.00

Cleveland

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	44.00 to 45.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Cut structural & plates, 2 ft & under	45.00 to 46.00
Drop forge flashings	37.00 to 38.00
Low phos. punch'gs plate	38.00 to 39.00
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	42.00 to 43.00
Rails 2 ft and under	55.00 to 56.00
Rails 18 in. and under	56.00 to 57.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	53.00 to 54.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	48.00 to 49.00
Malleable	66.00 to 67.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 busheling	33.00 to 34.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00 to 18.00
Low phos. plate	40.00 to 41.00
Structurals and plate, 2 ft and under	41.00 to 42.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	18.00 to 19.00
No. 1 RR hvy. melting	38.50 to 39.50
Rails, random lengths	44.00 to 45.00
Rails, 18 in. and under	50.00 to 51.00
Angles and splice bars	44.00 to 45.00
RR specialties	44.00 to 45.00
Cupola cast.	50.00 to 51.00
Heavy breakable cast.	40.00 to 41.00
Cast iron brake shoes	40.00 to 41.00
Stove plate	45.00 to 46.00
Cast iron car wheels	40.00 to 41.00
Rerolling rails	54.00 to 55.00
Unstripped motor blocks	41.00 to 42.00

Birmingham

No. 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	32.50 to 33.50
No. 1 special bundles	36.00 to 37.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	36.00 to 37.00
Elec. furnace, 2 ft & under	34.00 to 35.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft	41.00 to 42.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	40.00 to 41.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	43.00 to 44.00
Rerolling rails	54.00 to 55.00
No. 1 cupola cast.	56.00 to 56.00
Stove plate	55.00 to 56.00
Cast iron car wheels	41.00 to 42.00
Unstripped motor blocks	42.00 to 43.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	25.00 to 26.00
No. 2 dealer bundles	18.00 to 19.00
Machine shop turnings	9.00 to 10.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Clean cast. chem. borings	18.00 to 20.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 prepared solids	195.00 to 200.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	34.00 to 35.00
Drop forge flashings	33.00 to 34.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Heavy breakable cast.	35.00 to 36.00
Mixed cupola cast.	44.00 to 45.00
Automotive cast.	52.00 to 53.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	100.00 to 105.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	27.00 to 28.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	27.00 to 28.00
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Clean cast. chem. borings	14.00 to 15.00
No. 1 machinery cast.	35.00 to 36.00
Mixed cupola cast.	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	$36.00 to $38.00
No. 2 hvy. melting	34.00
No. 1 dealer bundles	33.00
No. 2 bundles	22.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	$38.00 to $40.00
No. 2 hvy. melting	36.00 to 38.00
No. 1 dealer bundles	35.00
No. 2 bundles	18.00 to 20.00
Machine shop turn.	$16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under (foundry)	49.00
No. 1 cupola cast.	45.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Bush., new fact., prep'd.	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$45.00 to 46.00
Unstripped motor blocks	37.50 to 38.50
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	28.00 to 29.00

Justice Takes Aim At Copper Mergers

Government wants to keep copper producers and fabricators from merging.

But some leaders in the trade say mergers are necessary if the copper industry is to prosper.

■ Unless someone gives, the copper industry and the Justice Dept. will square off on an issue basic to the future of the industry.

Last week Justice filed suit to make Kennecott Copper Co. let go of its Okonite Div., formerly an independent cablemaker Kennecott acquired through a stock exchange. But, the name Kennecott on the complaint is almost coincidental.

Justice is really out to prevent the copper producing industry and the copper fabricating industry from getting any closer, particularly by the merger route.

The Justice complaint says specifically, "Concentration in copper production has resulted in large part from mergers and acquisitions by all of the leading copper producing companies. . . . Further, integration by the major copper producers into copper fabrication has been achieved almost entirely by acquisition."

No More Mergers—The Justice Dept. asks an injunction to prevent Kennecott from any future mergers with any copper producer, fabricator or seller.

The rub comes in because many copper leaders have been saying point blank that the chasm in copper between producers and fabricators has been a contributing factor in opening the door in some markets to more closely knit, more flexible industries, like aluminum. There has been a definite move developing to bring the two industries, which originated and developed independently, into the same sphere.

No Comments—Kennecott isn't talking. They have 20 days to reply and will likely be granted some extension.

The Justice Dept. attorney filed the suit, then promptly left for two weeks of military reserve duty.

Justice Says — A conversation with another Justice spokesman was full of "howevers." He claimed the seven months between the time of the Kennecott-Okonite marriage and the complaint filed is not unusual. However other cases of this type have been argued before the merger.

The Department spokesman refused to comment on whether Justice had prior knowledge of the merger. However, the trade is pretty sure it did, though unofficially.

Finally, the Justice Dept. denies this is meant to be a precedent-setting case. However, the trade disagrees almost unanimously. It says the language of the complaint is very indicative.

World Aluminum

After looking it over, the trade believes the Alcoa-Imperial Chemicals offspring, Imperial Aluminium (story on P. 39) may well indicate the direction the world aluminum industry is headed.

Imperial Aluminium is a fabricator. A natural place to get primary metal would be from one parent. And Alcoa has, in fact, been selling some metal in Britain, at less than in the U. S. In the long run there's no future in this because of higher production costs here.

Right now, no one else has announced plans for any primary capacity outside the U. S. But they're all taking a close look at the possibilities.

Auto Aluminum

Chrysler Corp. has assured itself of a pretty solid supply of aluminum no matter how demand skyrockets in the future.

Aluminium Ltd. has gotten a whole lot more than its foot into the automotive door, considered by some the market with the most potential.

The two have formed a third company, Chryslum Ltd., owned 51 pct by Chrysler of Canada, and 49 pct by Aluminium Ltd.

Tin prices for the week: June 24—103.625; June 25—103.75; June 26—103.75; June 29—103.375; June 30—103.375.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	26.80	26.10	8/1/58
Copper (E)	31.80	30.00	3/9/59
Copper (CS)	30.00	30.50	6/29/59
Copper (L)	31.80	30.00	3/9/59
Lead, St. L.	11.80	11.30	5/7/59
Lead, N. Y.	12.00	11.50	5/7/59
Magnesium ingot	38.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	162-182	185-205	11/3/58
Zinc, E. St. L.	11.00	11.50	2/25/59
Zinc, N. Y.	11.50	12.00	2/25/59

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 113.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 .249	.250- 3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6- 8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	55.63	.....	52.86	55.83
Brass, Yellow	48.24	48.75	48.18	51.05
Brass, Low	51.23	51.77	51.17	54.54
Brass, R L	52.29	52.83	52.23	55.60
Brass, Naval	52.80	.....	46.61	56.21
Munts Metal	50.85	.....	46.16	.....
Comm. Bz.	53.90	54.44	53.84	56.96
Mang. Bz.	56.54	.....	50.14	.....
Phos. Bz. 5%	75.34	.....	75.84	.....

Free Cutting Brass Rod 32.73

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.75-$6.25; alloy, $7.75-$10.00; Bar, HR or forged, commercially pure, $4.25-$5.00; alloy, $4.25-$7.50; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.30
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis.. $ 1.31
Cobalt, 97-99% (per lb.) ... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 33.30 to 42.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $239 to $241
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz... $18 to $20
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 30.25
- No. 120 ..... 29.00
- No. 123 ..... 28.00

80-10-10 ingot
- No. 305 ..... 34.50
- No. 315 ..... 32.50

88-10-2 ingot
- No. 210 ..... 43.50
- No. 215 ..... 39.25
- No. 245 ..... 35.00

Yellow ingot
- No. 405 ..... 24.75

Manganese bronze
- No. 421 ..... 27.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.75-25.00
- 0.60 copper max. 24.50-24.75

Piston alloys (No. 122 type).. 24.25-25.25
No. 12 alum. (No. 2 grade)... 21.50-22.00
108 alloy 22.00-22.50
195 alloy 25.00-26.00
13 alloy (0.60 copper max.).... 24.25-24.75
AXS-679 (1 pct zinc) 21.75-22.25

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 22.50-23.50
Grade 2—92-95% 21.25-22.25
Grade 3—90-92% 20.25-21.25
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27½	26¾
Yellow brass	20⅝	18¾
Red brass	24¼	23½
Comm. bronze	25⅛	24⅜
Mang. bronze	19⅛	18⅜
Free cutting rod ends.	20½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25½
No. 2 copper wire	24
Light copper	21¾
*Refinery brass	23½
Copper bearing material	22½

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25½
No. 2 copper wire	24
Light copper	21¾
No. 1 composition	20¼
No. 1 comp turnings	19¾
Hvy. yellow brass solids	14¾
Brass pipe	15½
Radiators	16

Aluminum

Mixed old cast.	13½—14½
Mixed new clips	16 —17
Mixed turnings, dry	14 —15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	23½—24
No. 2 copper wire	21½—22
Light copper	19½—20
Auto radiators (unsweated)	13½—14
No. 1 composition	17¾—18¼
No. 1 composition turnings	16¼—16¾
Cocks and faucets	13¾—14¼
Clean heavy yellow brass	12¼—12½
Brass pipe	14 —14½
New soft brass clippings	14¾—15¼
No. 1 brass rod turnings	12 —12½

Aluminum

Alum. pistons and struts	7 — 7½
Aluminum crankcase	10¾—11¼
1100 (2s) aluminum clippings	14½—15
Old sheet and utensils	10¾—11¼
Borings and turnings	6½— 7
Industrial castings	10¾—11¼
2020 (24S) clippings	12 —12½

Zinc

New zinc clippings	4¾— 5¼
Old zinc	3¼— 3½
Zinc routings	2 — 2¼
Old die cast scrap	1¾— 2

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	37-40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	30-32
Clean Monel turnings	30-32
Old sheet Monel	26-28
Nickel silver clippings, mixed	18
Nickel silver turnings, mixed	15

Lead

Soft scrap lead	7 — 7¼
Battery plates (dry)	2 — 2¼
Batteries, acid free	1⅞— 2⅛

Miscellaneous

Block tin	77 —78
No. 1 pewter	59 —60
Auto babbitt	40 —41
Mixer common babbitt	9½—10
Solder joints	13¼—13¾
Siphon tops	42
Small foundry type	9½—10
Monotype	9½—10
Lino. and stereotype	8½— 9
Electrotype	7 — 7½
Hand picked type shells	5¼— 5¾
Lino. and stereo. dross	2¼— 2¾
Electro dross	2¼— 2¾

(Effective June 29, 1959)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,13*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *F3*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.45 *S2*	

(Effective June 29, 1959)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Holloware Enameling 29 ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *UI*	6.325 *UI*				7.575 *UI*	9.325 *UI*			$10.50 *UI*	$9.20 *UI*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *LI*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *UI, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A1*	6.275 *A1*										
	Gary, Ind. Harbor, Indiana	5.10 *UI, I3,YI*	6.275 *UI, I3,YI*	6.875 *UI, I3*	6.775 *UI, I3,YI*	7.225 *UI*	7.525 *UI, YI,I3*	9.275 *UI, YI*		6.40 *YI*	$10.40 *UI, YI*	$9.10 *I3, UI,YI*	7.85 *UI, YI*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*	6.875 *G2*							$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, SI*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *SI*	7.225 *SI**, *R3*	7.525 *R3, SI*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *UI, J3,P6*	6.275 *UI, J3,P6*	6.875 *UI, J3* 7.50 *E3**	6.775 *UI*		7.525 *UI, J3*	9.275 *UI, J3*	10.025 *UI, J3*	6.40 *A5, J3,P6*	$10.40 *W5, J3*	$9.10 *UI, J3*	7.85 *UI, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5; W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *UI, YI*	6.275 *YI*	7.50 *J3**	6.775 *YI*		7.525 *YI*	9.275 *YI*		6.40 *YI*			
WEST	Fontana, Cal.	5.825 *KI*	7.40 *KI*				8.25 *KI*	10.40 *KI*			$11.05 *KI*	$9.75 *KI*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

*Electrogalvanized sheets.

(Effective June 29, 1959)

*7.425 at Sharon-Niles is 7.225

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875 *L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				8.675 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective June 29, 1959) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $280 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.

(Effective June 29, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	15 pct	20 pct	Sheet (*I2*) 20 pct
	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 43.15; 1 side, 36.20.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	15.35
Cleveland *R3*	.....	.....	.....	10.10	.....	.....
So. Chicago *R3*	.....	.....	.....	.....	.....	.....
Ensley *T2*	5.75	6.725	.....	10.10	6.875	.....
Fairfield *T2*	.....	6.725	.....	.....	6.875	.....
Gary *U1*	5.75	.....	.....	10.10	.....	.....
Ind. Harbor *I3*	.....	.....	.....	.....	.....	.....
Johnstown *B3*	.....	6.725	.....	10.10	.....	15.35
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *P5*	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	34.35
Erie, Pa., f.o.b.	32.00
Cleveland, del'd	34.19
Cincinnati, del'd	32.84
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	Length (In.)	Price	CARBON* Diam. (In.)	Length (In.)	Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
In bulk	46.00
In sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective June 29, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...		190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***	177	190	172	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	178		196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
Sparrows Pt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
National Tube	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

(Ferroalloy prices will next appear in the July 9 issue.)

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine				
½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1⅛" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
C. P. Hex, reg. & hvy.	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	41
Semi-finished Hex Nuts	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller 65

Rivets *Base per 100 lb*

½ in. and larger $12.85

Pct. Off List

7/16 in. and smaller 15

Cap Screws *Discount (Packages)*

Full Finished H. C. Heat Treat

New std. hex head, packaged	Full Case
¼" diam. and smaller x 6" and shorter	54
⅜", ⅞", and 1" diam. x 6" and shorter	38
⅝" diam. and smaller x longer than 6"	..
⅜", ⅞", and 1" diam. x longer than 6"	..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Plain Finish		
Cartons	60	50
Bulk		
Quantity		
To ¼" diam. incl. } 25,000-and over	60	..
5/16 to ½" diam. incl. } 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk		
⅜" diam. & smaller } 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	46.00
Electrodeposited	38.00
Brass, 80-20, ball anodes, 2000 lb or more	51.50
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	18.00
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.20
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 24.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.8

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*	.....	.....	.....	.....
Baltimore	$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99	.....	.....	.....	.....	.....
Boston**	.10	10.22[1]	11.27[2]	12.07[3]	12.17[4]	10.42[5]	10.72[6]	10.34[7]	13.45*	16.79	15.79	20.29	19.54
Buffalo	.15	8.55	9.75	11.00	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago**	.15	8.39[1]	9.60	11.05	10.35[4]	8.62[5]	9.16[6]	8.79[7]	9.30	16.20	15.20	19.70	18.95
Cincinnati**	.15	8.56[1]	10.41[2]	11.10	10.67[4]	9.00[5]	9.84[6]	9.11[7]	11.68*	16.52	15.52	20.02	19.27
Cleveland**	.15	8.32[1]	9.61[2]	11.16[3]	10.36[4]	8.76[5]	9.63[6]	9.36[7]	11.40*	16.31	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit**	.15	8.65[1]	10.61[2]	11.40	10.72[4]	8.99[5]	9.84[6]	9.10[7]	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60	.....	8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles		8.70[8]	11.20-11.80	12.20	9.15	9.10	9.00	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee**	.15	8.53[1]	9.74	11.19	10.49[4]	8.76[5]	9.30[6]	8.93[7]	9.54	16.34	15.34	19.84	19.09
New York	.10	9.27	10.59	11.40	9.74	9.87	9.84	10.09	13.35*	16.16	15.60	20.10	19.35
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.30	9.35	10.71	9.35	9.25	9.20	9.50	12.05*	16.58	15.58	20.08	19.33
Pittsburgh**	.15	8.32[1]	9.61[2]	10.95[3]	10.36[4]	8.52[5]	9.24[6]	8.62[7]	11.40*	16.20	15.20	19.70	18.95
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30*	18.50	17.45	20.75	20.25
San Francisco	.10	9.75	11.20[9]	11.50	9.85	10.10	9.95	10.25	13.70	17.05	16.35	21.05	20.60
Seattle		10.30	11.55	12.50	10.25	10.10	10.20	10.50	14.70	17.15	16.80	20.65	20.60
Spokane	.15	10.45	11.70	10.90	10.65	10.25	10.35	11.15	14.85	17.75	16.95	21.55	20.75
St. Louis**	.15	8.77[1]	9.98	11.43	10.73[4]	9.00[5]	9.76[6]	9.17[7]	9.93	16.58	15.58	20.08	19.33
St. Paul	.15	8.94	10.19	11.64	8.99	9.45	9.53	9.70	10.16	.....	15.41	.....	19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** Prices based on 2000 lb item quantities except for galv. sheet, c-f and alloy bars.

†† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds. [1] 10 ga. x 36 x 96 —120; [2] 20 ga. x 36 x 96 —120; [3] 10 ga. x 36 —120; [4] ¼" x 1"; [5] ¼" x 84"; [6] I-Beams 6 x 12.5; [7] Rounds—¾-2 15/16"; [8] 15 ga. & heavier; [9] 14 ga. & lighter.

(Effective June 29, 1959)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	6[illegible].00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31 0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Besemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

(Ferroalloy prices will next appear in the July 9 issue.)

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit. *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown. *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7* Wallingford. Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3,* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

(Effective June 29, 1959)

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more.

Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said.

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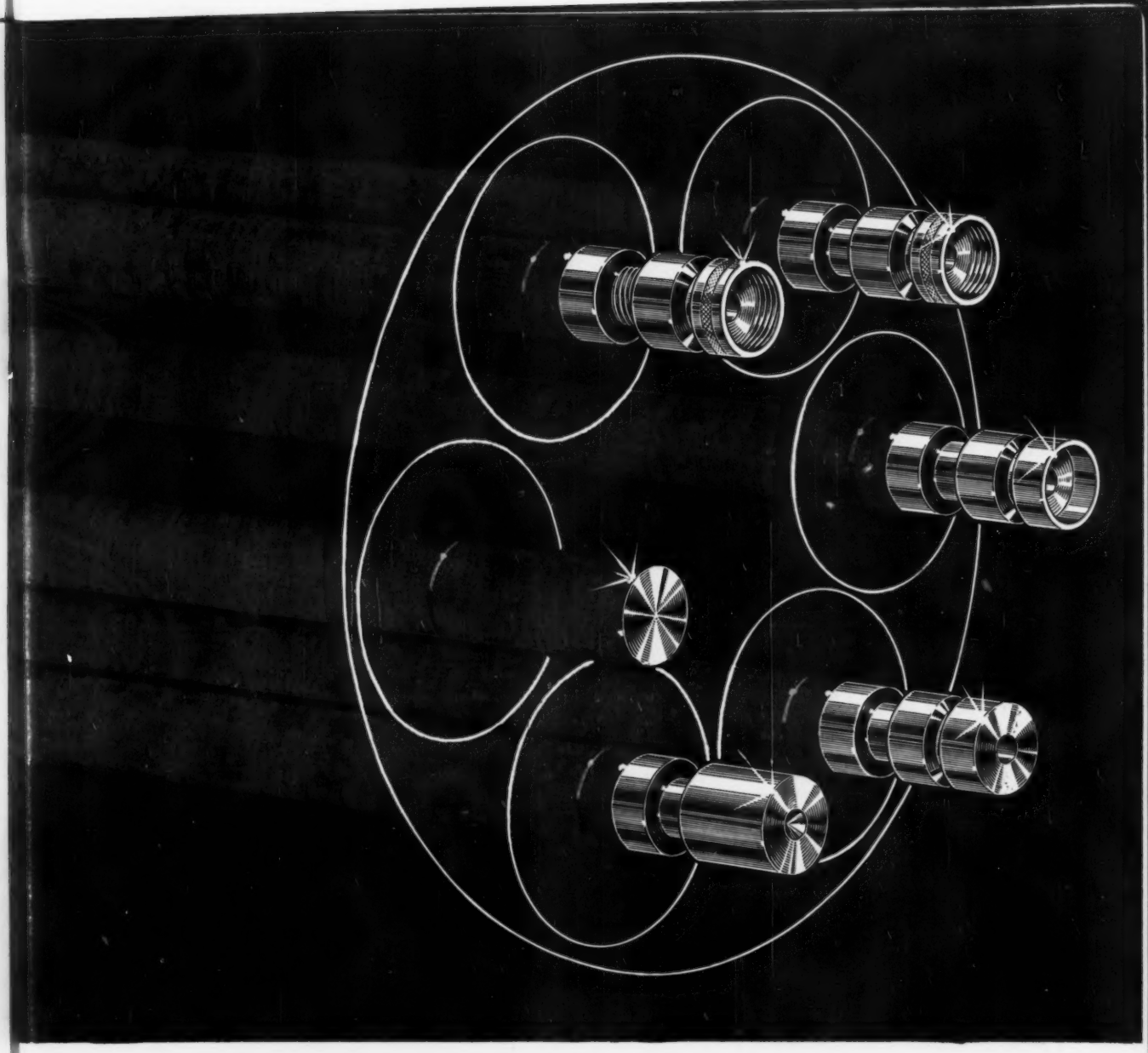

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Model 82 • Six Spindles • 3½" Capacity • All New

Here is a *brand new* New Britain . . . the most modern large capacity bar machine available. The Model 82 brings to the 3½" size range all the versatility and exclusive New Britain features previously available only on smaller models. Designed from the ground up for large capacity work, the Model 82 is the only 6-spindle machine on the market that offers a really up-to-date replacement for the older, slower methods currently used for this size range.

Each of the six spindles on the Model 82 has an independent, cam-operated cross slide. These cross slides combined with the end-working tool slide allow practically unlimited tooling combinations.

The Model 82, like all New Britain Bar Machines, has a special lifting and locating mechanism which prevents wear on the spindle carrier. Rigid locking of the carrier to the massive frame during the cutting cycle eliminates vibration.

The power, massiveness, speed range, accuracy, ease of changeover, coolant capacity and every other feature designed into the Model 82 makes this the right machine for high-precision, high-production, large-capacity bar work.

Why not investigate the possibilities the Model 82 offers in your plant? When you get right down to it, it's the first chance you've had in a long time to update production in an area that needs it badly. Complete catalog material is available on the whole range of New Britain Six Spindle Bar Machines. For your copy, write to The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Conn.

REBUILT—GUARANTEED
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STEEL MILL SPECIALS

(2)—3000-HP Whse. Motors, 600-B.D.C., 600 R.P.M. (in tandem, encl. F.Vent.)
(1)—2200-HP Whse. Motor, 600-V.D.C., 92/132 R.P.M., enclosed, F.Vent.
(4)—700-HP Whse. Motors, 250-V.D.C., 300/700 R.P.M., enclosed, F.Vent.
(2)—645-HP S.S. Motors, 300-V.D.C., 1000 R.P.M., enclosed, F.Vent.
(2)—600-HP Allis-Chalmers Motor, 600-V.D.C., 300/600 R.P.M., mill type.

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(1)—1800-HP, 252 R.P.M. Whse. slip ring motor, 2300-V., 3 ph., 60 cy.
(3)—1500-HP, 444 R.P.M. General Electric slip ring motors, 6600/4160-V., 3ph., 60 cy.

★ ★ ★ ★ ★ ★ ★

(1)—1250-KBA Whse. Hi-Cycle Frequency Set, 800-V., 960 cycle with 1875-HP syn. motor, 2300-V., 3 ph., 60 cy. with all switchgear.

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Philadelphia Market Stays Active

Used machinery sales in the Delaware Valley area held or improved their 1959 pace during June.

Sellers expect a drop in July and August but are confident about good business from then on.

▪ Early summer sales pleasantly surprised Philadelphia area used machinery dealers.

Generally business held up as well as in the winter despite warmer weather and the unsettled steel labor situation. In some cases it was even better than in the winter months.

Sales Improve—"During June we did better than in any month since the first of the year," says one dealer. "There's been a real burst of activity that kept sales interest high."

"Business is still good," says another. "If a customer wants something and the price is right, he buys. There's even less haggling over price than we've seen in the past year or so."

"Sales are a little better every month," comments a third dealer. "We expect a falloff in the summer, but it hasn't come yet. The buyers are optimistic. They aren't holding back as much on equipment spending."

. . . And So Do Prices—The dealers also concede that prices are improving. They are still not near 1957 levels, but have moved up from 1958's lows. As a result profits have also improved.

Further tightening in prices is expected in the fall. One dealer points to an increasing demand for production equipment. If it continues demand will push price levels up, he adds.

Less Financing—As always auctions still bring higher prices than individual sales. "When buyers get into an auction they still bid their eyebrows off," one dealer comments.

More machinery sales are for cash these days. And when financing is arranged it's usually less difficult than it was during the recession.

What's Wanted — Demand is greatest for general-purpose production equipment such as radial drills, lathes, and boring mills. Supply doesn't present much of a problem, according to dealers.

Supply Sources—One source of equipment: Government sales of surplus machinery. Despite complaints in recent months about government auction sales depressing the market, the dealers still find them useful.

Says a dealer: "Sometimes you visit a fellow dealer and notice a good-condition machine. You find he bought it at a government sale. And you find the price he paid was a reasonable one."

Undoubtedly, as the dealers expect, the hot summer days will put a brake on sales. But beyond that point they are confident of a good year. Their customers are busier, more interested in buying equipment, and more ready to spend money.

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BENDING ROLLS
10' x 10 Ga. Bertsch No. 6 Initial Type
13' x 1⅛" Bertsch Initial Type
20' x ⅛" Niles Pyramid Type
32' x ⅜" BALDWIN PYRAMID TYPE—Late

BRAKE—BOX & PAN
8' x ¼" Dreis & Krump, 12" Finger Extension

BRAKES—PRESS TYPE
90 ton Niagara, Model 90-8-10
8' x 3/16" Warco
16' x 10 Ga. Clearing

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	40' Span	220 Volt D.C.
5 ton P&H	57' Span	220/3/60 A.C.
8 ton P&H	55' Span	230/3/60
10 ton P&H	39' Span	230 Volt D.C.
10 ton Milwaukee	57' Span	230 Volt D.C.
10 ton Shaw	48' Span	230 Volt D.C.
10 ton Whiting	75' Span	220/3/60 A.C.
10 ton Shaw	120' Span	230 Volt D.C.
30 ton Shaw	70' Span	230 Volt D.C.
120 ton Niles	67' Span	230 Volt D.C.
120 ton Shepard Niles	77' Span	220/3/60 A.C.

DRAW BENCHES
7,000 lb. Draw Bench, 51 ft. Draw
10,000 lb. Draw Bench, 50 ft. Draw
35,000 lb. Draw Bench, 41 ft. Draw

FLANGING MACHINE
Blue Valley Flanging Machine, Capacity ½"

FORGING MACHINES
1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING 800 lb. to 12,000 lb. incl.

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#250C Manville Single Stroke Solid Die
#44 Waterbury Farrel Dble Str Open Die
¾" National DSSD, with 1" National Hydr. Straightener and #4 Ajax Hogue Wire Drawer—All new 1956

LEVELERS—ROLLERS
24" Torrington, 9 Rolls 8" Dia.
60" Guide 17 Rolls 4½" Dia.
72 Leveler 17 Rolls 2⅝" Backed Up

NIBBLER
Pullmax Model 2, Capacity 11/32"

PRESSES—HYDRAULIC
300 ton Southwark Platen 28" x 28", Stroke 25"
500 ton Watson Stillman Piercing Press, 48" x 72"
600 ton Birdsboro, Platen 48 x 48", Stroke 15"
1000 ton Southwark Bed 44" x 54", Stroke 20"
4500 ton B-L-H Bed 68 x 68", Stroke 40"

PRESS—KNUCKLE JOINT
800 ton Cleveland Model 8-K, 6" Stroke

PUNCH & SHEAR COMBINATIONS
#2½ Buffalo Ironworker
#8 Kling, 36" Throat Capacity 1⅝" x 1"

RIVETERS
150 ton Southwark Hydr., 125" Throat
275 ton R. D. Wood Hydr., 18'6" Throat

ROLLING MILLS
3½" x 7" Six Roll Cluster Mill
10" x 14" Single Stand Two High
13" x 16" Single Stand Two High
16" x 24" Two Stand Two High
20" x 36" Single Stand Two High
26" x 60" Single Stand Two High
12" x 32" Birdsboro 3-Hi Bar Mill
22" x 40" Lewis 3-Hi Sheet Mill
31" x 52" x 77" Three Stand 4-High

ROLL—FORMING
18 Stand Custom Built 2½ Shaft, will take 36 wide

ROLLS—PLATE STRAIGHTENING
72" McKay 9 Rolls 15" Dia. Backed-up
92" Hilles & Jones, 6 Rolls 10" Dia.

SAW
Model 122-BA Ty-Sa-Man., Capacity 8 Cuts 2" Deep at one time 15" wide, 16 ft. long

SCALPING OR BILLET PEELING MACHINE
Medart #6 Size HFBP, Capacity 3½" to 5" incl.

SHEARS, MISC.
36" Hallden Drum Type, Capy. 33-38 Ga.
60" x 10 Ga. Cut-off Line

SHEAR—ROTARY
No. 22A Quickwork Whiting 3/16" Capacity

SHEARS—SQUARING
6' x 14 Ga. Edwards, Motor Drive—LATE
10' x 10 Ga. Wysong & Miles
6' x 3/16" Stamco
18' x 3/16" Verson Model E-18
8' x ¼" Bertsch

SLITTERS
36" Wean Slitting Line, Arbor 5" Dia.
84" Slitting Line, Arbor Dia. 7"

STRAIGHTENER
Torrington #1734 12-Roll, Capy. 1¾", Rd. 1-9/16"

TESTING MACHINES
20,000 lb. Baldwin Univ. Hydraulic
50,000 lb. Olsen 3-Screw Beam Type Universal
500,000 lb. Olsen, Super DeLuxe Compression

WELDING POSITIONER
16,000# Ransome Model 160P

WIRE DRAWING MACHINES
Type B Morgan 4-Block Capy. #5' Rod down
Scudder 3-Block 20 Dia.
Superior 7-Draft Cone Type Capy. 14 Ga. down

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1	700	A.C.		2300	500
1	600	Whse.	CW-4-32D-15	440	1778
1	500	G.E.	MT-412	2200	439
1	500	Whse.	CW	550	350
1	300	G.E.	MTP-561	2200	1800
1	200	G.E.	IM	440/2200	580
1	125	G.E. unused	MT-557	220/440	1200
1	100	G.E.	MT-564	440/2280	450
1	250	G.E.	IM-16	220/440	875
1	250	A.C.	ANY	550	600
1	250	Whse.	CW	2200	450
1	250	Cr.Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	IE-13B	220	1800
2	200	Whse.	CW-890	2300	1775
1	200	Cr.Wh.	SR-26QB	440	505
2	200	G.E.	IM-17A	2200	435
3	100	A.C.		440	695

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2	100	Whse.	B.B.C8-607	220/440	1780
1	800	G.E.	KT-573	2200	1180
1	500	G.E.	FT-559 AY	2200	3600
2	500	Whse.	CS-1115	2300	863/445
4	500	Whse.	CS-1216	2200	500
2	450	Ell.	F-3910	2200	1200
1	400	Whse.	CS-7151-610H	6600/4000	3585
1	300	Whse.	CS-1002	2300/440	600
2	200	Whse.	C8-8558 D.P.	220/440	1750
1	150	G.E.	FT-558	2200	875
1	150	Whse.	CS	440	580
1	125	Whse.	CS-764C	220/440	1160
3	100	Whse.	CS-760C	2200/440	1100

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1	1750	G.E.	TS	2300/4600	900
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*Amchem Products, Inc. 8
American Air Compressor Corp. 124
American Optical Co. 92
Anaconda Aluminum Company . 19
*Apex Machine & Tool Co., The . 87
Armco Steel Corp. 6
Armco Steel Corp., Sheffield Div. 107
Austin-Western Works Construction Equipment Div., Baldwin-Lima-Hamilton Corporation 102

B

Baldt Anchor, Chain & Forge Div. 126
Baldwin-Lima-Hamilton Corp., Austin-Western Works Construction Equipment Division 102
Bay City Forge Co. 126
Belyea Co., Inc. 123
Bertsch & Company 88
Bethlehem Steel Co 1
Blaw-Knox Company, Aetna-Standard Division 10
Bliss, E. W. Co., Press Division Back Cover
*Boston Gear Works 48
Boynton, A. J. & Co. 128

C

Carco Industries, Inc. 125
Carlstrom Pressed Metal Co. 127
Cattie, Joseph P. & Bros. Inc. 128
Cleveland Crane & Engineering Co., The Steelweld Machinery Div. 18
Commercial Die Co. 126
Consumers Steel & Supply Company 125
Continental Screw Co. 58
*Copperweld Steel Co. Aristoloy Steel Division Inside Front Cover
Cox & Sons Co., The 123
Crucible Steel Casting Co. 120
*Crucible Steel Co. of America 28, 29 & 56

D

Davidson Pipe Co., Inc. 124
Demag 33
Detroit Steel Corp. 47
*Dreis & Krump Mfg. Co. 15
*Duraloy Co., The 103

E

Eastern Machinery Co., The 123
Edwards, F. J., Ltd. 125
Elastic Stop Nut Corp. of America 63
*Electric Steel Foundry Company 89
Eveready Supply Co. .....123 & 124

F

Ferry Cap & Set Screw Co., The 91

G

*Gisholt Machine Co. 23
Goodman Electric Machinery Co. 125
Goss & DeLeeuw Machine Co. .. 88
Great Lakes Steel Corp. ....24 & 25
Greist Manufacturing Co., The .. 127

H

Hardinge Mfg. Co. 127
Henry, A. T. & Company, Inc.... 123
Hoerner Boxes, Inc. 98
Huebel Mfg. Co., Inc. 126
Hyatt Bearings Div., General Motors Corp. 31
Hyman, Joseph & Sons 125

I

Industrial Distributors (Sales) Ltd. .....26 & 27
Inland Steel Co. 101
Iron & Steel Products, Inc. 122

J

Jeffrey Mfg. Co., The 86
Jocelyn Iron & Steel Corp. 127
Jones & Laughlin Steel Warehouse Division 34

K

Kano Laboratories 120
Keystone Forging Company 126
Kinderman, Lou F. 124
King Foundries, Inc. 127

L

Lafayette Machinery Co. ...124 & 125
Lamson & Sessions Co., The 5
Land, L. J., Inc. 123
Lang Machinery Co., Inc. 124
*LeBlond R. K. Machine Tool Co., The 60

M

MacCabe, T. B. Co. 122
Mahon, R. C. Co., The 126
Marshall Railway Equip. Corp... 124
Miles Machinery Co. 125
Morgan Factors Corp. 128
Morrison Railway Supply Corp... 124
*Mundt, Chas. & Sons 88

N

National Business Bourse, Inc.... 125
National Machinery Exchange ... 125
National Steel Corp. .....24 & 25
*New Britain Machine Co., The, New Britain-Gridley Machine Division 121
New England Pressed Steel Co... 127
New Jersey Zinc Co., The 55

O

Ohio Steel Foundry Co. 84
Olson Manufacturing Co. 126
Ornitz Equipment Corp. 124
Osborn Mfg. Co., The, Brush Division 90

P

*Palnut Company 99
Peninsular Steel Company 88
*Poole Foundry & Machine Co... 88
*Precision Tube Co. 13
Purdy Company, The 124

R

Rail & Industrial Equip. Co., Inc. 124
Reliance Electric & Engineering Co. ..... Inside Back Cover
*Republic Steel Corp. .....20 & 21
Roebling's, John A. Sons Corp... 17
Rosedale Foundry & Machine Co. 127
Russell, Burdsall & Ward Bolt & Nut Co. 52

S

Saling Manufacturing Company.. 127
Salig, I. I., & Sons 125
Sheffield Division Armco Steel Corporation 107
Smith, Thomas Co. 127
*Snyder Corporation 50
*Somers Brass Co., Inc. 11
*Southern Screw Co. 66
Stanhope, R. C., Inc. 124
Standard Pressed Steel Co. 30
*Steelweld Div., The Cleveland Crane & Engineering Co. 18
*Superior Tube Co. 32

T

*Texaco Incorporated 85
Timken Roller Bearing Co., The.. 36
Tinnerman Products, Inc. 14
Townsend Company, The 16
Tractor & Equipment Co. 125
*Trent Tube Co. Subsidiary of Crucible Steel Co. of America 54

U

United States Rubber Co. Mechanical Goods Div. 101
Universal Machinery & Equipment Co. 124

W

Wallack Bros. 125
Ward Steel Co. 109
Weatherly Foundry & Mfg. Co... 127
Weiss, B. M. Co. 125
Weiss Steel Co., Inc. 125
*Wender Presses, Inc. 84
Wheland Co., The 109
Whisler Equipment Co. 125
Wilcox Forging Corp. 127
*Wood, R. D. Co. 12

Z

Zak Machine Works, Inc. 88

CLASSIFIED SECTION

Clearing House 122-125
Contract Manufacturing 126-127
Employment Exchange 125
Equipment & Materials Wanted.. 125

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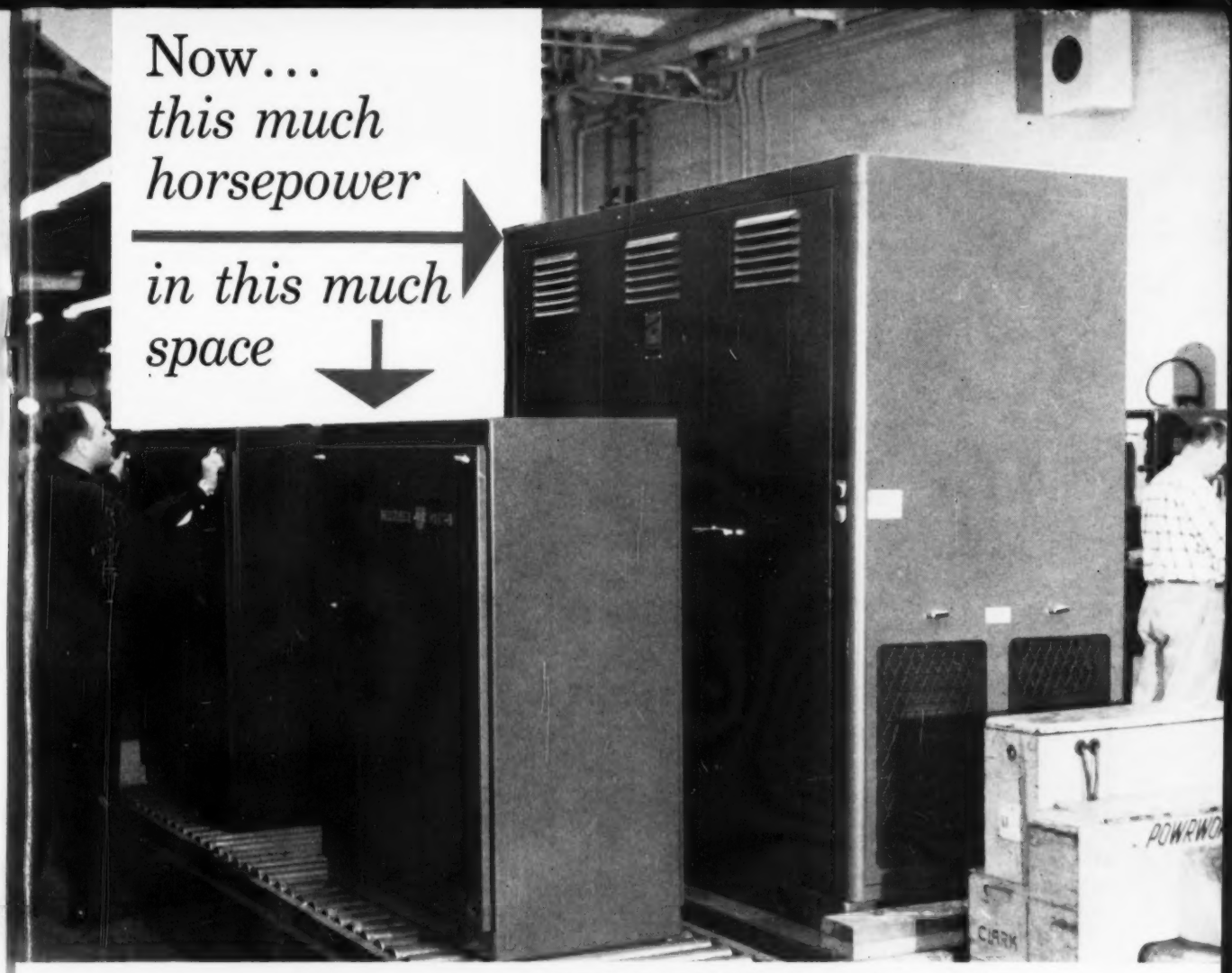

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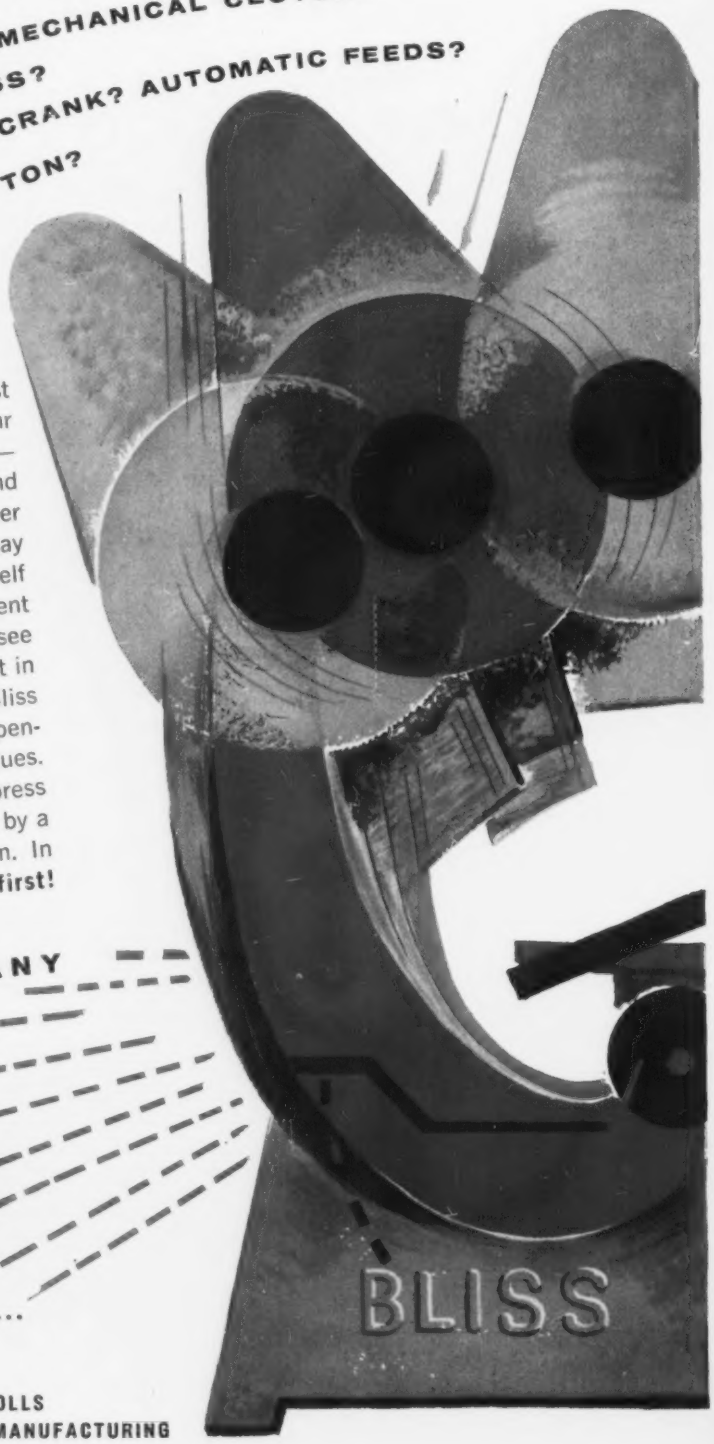

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